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Reasons for Personnel Research—*James R. Angell*

Development of Personnel Research Federation—*Alfred D. Flinn*

Basic Experiments in Vocational Guidance—*C. S. Yoakum*

News Notes Book Reviews Abstracts

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Reasons and Plans for Research Relating to Industrial Personnel

By James R. Angell, *President of Yale University*

The following address was delivered by President Angell to a conference on personnel research in Washington, November 12, 1920. This conference preceded and led to the organization of the Personnel Research Federation. This statement together with an address of President Gompers on the part of labor in personnel research,[1] admirably set forth the spirit in which the Federation was founded.

THROUGH the generosity of the trustees of the Commonwealth Fund, Engineering Foundation and the National Research Council have been enabled to call this conference in the belief that the time is ripe for a definite forward step in the solution of those crucial problems which center about personnel in industry. Many of these questions grow out of, or are directly related to, engineering practice and as such are of direct interest to engineering Foundation and to the Engineering Division of the National Research Council. Not a few of the issues involved fall within the field of the Medical and Psychological Divisions of the latter. It is perhaps unnecessary to enter into a detailed historical account of the organization of the conference. Suffice it to say that the immediate initiative comes from Engineering Foundation and that during the war both Engineering Foundation and the National Research Council had conducted investigations falling within this general field. Neither organization, however, has felt itself at all competent to attack the problem in any large and inclusive way, as there are vast numbers of critical issues with which neither is equipped to cope. Both organizations have the men and the facilities to deal with a few of the more technical phases of the problem, but neither is competent to handle the economic, social and generally humanistic aspects of the case. They have therefore decided to combine in bringing together this group of men and women, representing, as they believe, a very broad, if not exhaustive range of organizations, vitally related to one or another feature of the problem and competent to decide along what lines and by what methods coordinated effort can be fruitfully directed.

If our deliberations are to eventuate in results of a constructive and successful kind, certain pre-conditions must be constantly borne in mind. In the

[1] President Gompers' address will appear in the next issue of this Journal.

F.P.

first place, there must be no question of the fair and open-minded impartiality of the persons in charge of any enterprise we set on foot. In the second place, and equally important, there must be no question of their practical, intellectual and scientific competency to handle the problems with which they undertake to deal. They must enjoy and deserve prestige. In so far as the questions which are dealt with at this time are incapable of decisive treatment in terms of ascertainable fact, there must be generous and adequate representation of divergent opinion. In other words, there must be convincing *prima facie* evidence of freedom from bias, coupled with intellectual integrity, courage and general competency. At best, mistakes will be made, but the most fatal of all would be to start an undertaking foredoomed to failure because of partisanship, real or fancied, in a field where absolute honesty and impartiality are of the very essence of the contract.

Assuming general assent to this formulation of the essential pre-conditions, we shall next have to consider how best to proceed, and here we are at once confronted by a number of perplexities. You have had submitted in the preliminary programs of this meeting a number of problems to which attention has already been vigorously directed. I need not, at the moment, repeat them. But by exhibiting the wide range of interests represented in our gathering (and they include by no means all which have been urged), they instantly present the necessity to determine where we shall begin and how, for it would be obviously impracticable to attack simultaneously along the whole front. This consideration, accordingly, compels us to decide among competing opportunities; those which are most deserving or most likely to prove susceptible to successful attack. Coincident with such an effort to delimit the field of work, and constituting a highly important part of that problem, is the determination of the means through which we shall work. One of the comments frequently made is that enterprises of this character are the proper function of the federal government, that private agencies lack the necessary power and prestige to accomplish the proposed results. This is a view which must be given due consideration. Certainly no one desires to do badly work which any one else is prepared to do well.

Attention is often called to the fact that many agencies are now working in these fields without any attempt at coördinating their programs or the results of their undertakings. There is, moreover, reason to believe that in some instances, at least, both their methods and their personnel leave something to be desired. In the long run, this policy must result in wastage and duplication of effort, but how to relieve the situation has not been so clear. It is fairly certain that some of the problems deserving attention are not at this moment receiving any serious, systematic study. In these cases, we may perhaps be able to secure the interest of competent agencies, or if such are lacking, we may possibly call them into being; but the largest possibilities are probably in the region of establishing mechanisms of

coördination and coöperation which may promise some assurance of both continuity and community of programs, prompt interchange of findings, especially for purposes of educational training, expert assistance, and, in general, the services of a central body, intelligently in touch with a great variety of undertakings, all of which converge upon the fundamental problems of modern industry on its human side. That we should sedulously avoid any danger of merely adding one more to the agencies already working in too great isolation upon these questions, all will agree. Our field must be clearly defined, and the chances of our occupying it with success must be large, if not certain. Otherwise, we can hardly justify the solicitation of funds, without which the plan must perish even before it is born. Moreover, it must be clear that there is nothing coercive or dictatorial about our program. Should we establish a bureau or institute, it would assume to assist other agencies only when desired. We contemplate no super-scientific research autocracy.

We shall have also to consider whether it be wise to set out with a relatively permanent project in mind, or whether we should regard any steps which we take as tentative and purely experimental. The decision on this issue will obviously play a decisive part in any financial policy we may adopt. Although the members of this conference have doubtless come with certain prejudices regarding the wise answers to these questions which I have suggested, it should be clearly understood that those responsible for the meeting have in no way wished to pre-judge any of these issues, nor to do more than consider with the rest of you the possibilities presented. If it should not seem to you that a program of the general type is at present practicable or advisable, we should accept your judgment, and even if we went forward with some of the specialized undertakings which we believe ourselves competent to guide, we should accept as conclusive your negative judgment on the larger proposal. On the other hand, if you think a forward step can be taken on the broader lines, we are ready to do our part in so far as our resources permit. We should not, in this case wish to become the responsible directing agents, for our composition does not render this appropriate, even were it desired by you. I am sure that in this statement I voice the attitude of both the Engineering Foundation and the National Research Council. We have been glad to take the initiative, and we shall expect to receive instructions from our organizations to coöperate in any general plan agreed upon, but beyond that, we wish it clearly understood, we should not desire to go. In other words, we stand in this matter on exactly the same level with the rest of you here present.

How you will wish to organize any institute, or bureau, or committee which may commend itself to you, remains for you to determine. It may be that some extant agency, whether private or governmental, can be used as the nucleus around which our purposes can be developed. It may be that an entirely new organization is preferable. In the latter case it had occurred to us that a possible mode of

procedure would be to establish a small board of directors or trustees to be selected in some equitable fashion by such agencies as are represented here today, and to put in their hands, subject to proper endorsement by those they represent the actual selection of the necessary personnel to conduct an effective institute. Obviously there are other possible modes of procedure. This is proposed merely as a specific suggestion to focalize discussion. Our feeling in the Council and in the Engineering Foundation is that any organization we adopt should be plastic and adaptable, that it may feel its way gradually into the situation, and attempt at the outset only the more pressing and significant work. But all these questions are for you to pass upon.

Coming now to the real point of our meeting together, it may be said that whatever the technical means to which we resort for the realization of our purposes—and to assure success, they must receive the most thoughtful scrutiny—we are fundamentally interested to further the application of scientific research to certain of the critical problems affecting the happiness, welfare and efficiency of the great body of industrial workers, from manager to unskilled laborer. Indirectly, the community as a whole must profit by any improvement in the conditions of life and work which affect this industrial group, and our interest is therefore broadly humanitarian. It is our belief that throughout wide ranges of these problems, there is no longer justification for mere opinionating and for mere exploiting of preconceived social and industrial dogma. We recognize frankly that there are considerable regions within which it is at the moment extremely difficult, if not wholly impracticable, to apply genuinely scientific methods; but this fact should not discourage us from the effort to carry them to the farthest possible forward point. That we have in mind as our dominating motive the desire to improve contemporary conditions, should not be held to prejudice our ability to conduct impartial scientific investigation. Nor should it be assumed that we are unmindful of the many hopeful attempts which are in progress, directed to exactly the same end which has just been described. But it is our belief that many of these suffer from disabilities and limitations of one kind or another which might be relieved by appropriate means.

Certain of the hygienic problems of modern industry exemplify cases in which a thoroughly scientific study of causes and effects is possible with convincing conclusions regarding practice which will safeguard the health and vigor of all concerned. Not a few highly important results have already been attained in this field. The effects upon industrial productivity on the one hand, and physical vitality, on the other, of good and bad ventilation, of good and bad light, of high temperatures, of irritant fumes, of dust and other similar features are, theoretically, at least, within the field of scientific analysis, and the ascertainment of demonstrable fact. Similarly, and in a different zone of inquiry, it should be possible to secure thoroughly reliable data regarding the dominant causes of unrest in our industries, of excessive turnover and the

like. Many other instances of the same kind will suggest themselves to all who have experience in the industrial field.

Another type of problem in which there is the utmost need for careful and exhaustive studies of the factual situation, is represented in the determination of the compensation of unskilled as against skilled labor and the criteria by which a just wage scale may be determined. Here one enters upon a region of inquiry in which, after once the facts have been successfully gathered, there remains as the critical part of the process, the drawing of inferences and conclusions in connection with which one is inevitably thrown back upon certain social and philosophical conceptions regarding the desirable forms of industrial and political life. These are the fields in which, at present, discussion is often so acrimonious and seemingly so futile. There is on the one hand, generally, the most fatal lack of adequate data, and, on the other hand, a hopeless exuberance of social prejudice and conviction. Problems of this character are accordingly of a transition type partly within the field of genuinely scientific study and partly outside that field, in the zone of social philosophy.

Whether it be wiser to confine ourselves at the outset to those issues which lend themselves most readily to approach by sciences which have already developed reliable objective methods, or whether it be more desirable to plunge at once into issues which cannot at present be so treated, is also for you to decide. Broadly speaking it is probably accepted by all competent observers that at present the mathematical and physical sciences have developed the most objective, impersonal and trustworthy methods. The biological sciences probably rank next in this hierarchy of prestige, and the social sciences probably come last. In so far then as the problems of personnel in industry can be approached from the physical and biological side we may reasonably expect a somewhat higher order of certainty and reliability in our investigations than we are likely to gain from research on the economic and social side. This general rule has obvious exceptions, but it may perhaps be profitably borne in mind in deciding the main lines of work toward which it may be expedient to direct our efforts in the early stages of any movement we set afoot. It should be understood that these comments upon the relative status of the several sciences bear simply upon the situation in so far as we may decide ourselves to undertake new research. They have no immediate significance in so far as concerns the investigation already being carried on by extant agencies.

What we desire is to bring the best and most objective methods of modern science to bear on the problem, and anything which will accomplish this will in so far meet our purposes. We are under no illusions regarding the infallibility of contemporary scientific methods, but we do believe most sincerely that the spirit embodied in these methods is the only one which holds out real hope for a continuous forward movement in the development of a point of view and a technique adequate to cope with the ever-changing problems which life presents. In the par-

ticular field today enlisting our interest as we are gathered here we believe these methods have been unduly neglected, and that there rests on all of us who desire to see intelligence most profitably employed the obligation to extend as rapidly as may be the unquestioned benefits which in the long run always accrue from the substitution of science for ignorance, of expert knowledge for amateur opinion and traditional prejudice. It is in the faith born and bred of this belief that we have asked you to come here today to join in considering whether we may not convert this faith into beneficent deeds.

Development of Personnel Research Federation

By Alfred D. Flinn, *Secretary Engineering Foundation; Secretary, Personnel Research Federation*

The Start—Engineering Foundation

Late in 1918, Engineering Foundation undertook a limited study of the adjustment in industry of persons of peculiar traits or limited mental capacity. It was understood, however, that this was only one problem, and not the most important, of a large number relating to men and women and their work. Numerous organizations and individuals were found to be studying personnel matters, but independently, with few direct contacts, no coördination, no program and little coöperation. Several important parts of the subject were receiving little or no attention. Since the larger study would go into many fields of science and sociology, Engineering Foundation in June, 1919, requested National Research Council to consider the possibility of organizing research on a suitable scale, chiefly by bringing into coöperation the agencies already in this field.

Steps to a Conference—National Research Council

National Research Council appointed a committee. This committee sought information and advice from many persons and organizations interested in all phases of these questions. It was determined to call a small, but representative, preliminary conference at which the idea could be discussed in an informal way and some plan worked out for a trial. After a year's investigation, this committee issued invitations for a Preliminary Conference, November 12, 1920. Its purposes were stated to be

1. To learn in a general way what organizations are studying one or more problems relating to personnel in the industries, and the scope of their endeavors.
2. To determine whether these endeavors can be harmonized, duplication minimized, neglected phases of the problems considered, and advanced work undertaken.
3. To create a clearing-house for dependable, unprejudiced information about personnel in industry.
4. To formulate a comprehensive general plan into which all useful efforts may be fitted and in accordance with which future work may be directed.
5. To plan for the inauguration and support of coördinated studies in the several fields of industrial employment, by scientific methods, under unprejudiced direction, for the benefit of all concerned.
6. To devise ways and means for supporting the project.

Preliminary Conference

The Preliminary Conference was held on the assigned date in the building of the National Research Council

under the joint auspices of the Council and of Engineering Foundation. Twenty-six organizations had been invited to send representatives to this conference. All but three organizations so invited sent representatives. A number of individuals had been invited as such, so that the total attendance at the meeting was about fifty.

The following were the officers of the meeting:

Chairman: H. A. Bumstead,
National Research Council
Secretary: Alfred D. Flinn,
Engineering Foundation

The first business to come before the meeting was the creation of a series of committees to consider and report on various aspects of the problem of creating a permanent organization to deal with personnel research. Upon authorization of the Conference, the Chairman made the following appointments:

1. *Present Status of Personnel Research*
   Robert W. Bruere, Chairman
   H. S. Person
   Beardsley Ruml
   Joseph H. Willits
   John A. Voll
2. *Drafting*
   C. R. Mann, Chairman
   Miss Florence Thorne
   J. David Thompson
   Alfred D. Flinn
3. *Plan of Organization, Field of Work and Nature of Support for Personnel Research Federation*
   (a) *Functions and Scope of Organization*
      W. V. Bingham, Chairman
      J. Parke Channing
      P. J. McNamara
      Hugh L. Frayne
      Oswald W. Knauth
      Miss Frances A. Kellor
   (b) *Type of Organization*
      Frank B. Jewett, Chairman
      Miss Julia Lathrop
      Beardsley Ruml
      Ralph G. Wells
   (c) *Membership and Nature of Support*
      Harrison E. Howe, Chairman
      Louis B. Schram
      Dr. Alice Hamilton
      S. J. Williams
      George E. Barnett

The meeting was addressed by James R. Angell, then President of Carnegie Corporation, now President of Yale University, on "Reasons and Plans for Research Relating to Industrial Personnel,"[1] and by Samuel Gompers, President of the American Federation of Labor on "Coöperation of Workers in Study of Industrial Personnel Matters."[2]

The remainder of the morning's meeting was devoted to a discussion of some of the general problems attending the organization of personnel research. From this it became evident that the type of organization for which there seemed to be the greatest need was one that would act as a coordinator of the already existing agencies dealing with special phases of personnel research, rather than an organization that should undertake investigations and research upon its own account. The spirit of such an organization would be that of service, not of dictation or coercion. There was a paramount need for an agency to collect information on personnel

[1] The address appears elsewhere in this issue of the Journal.

[2] The address will appear in the June issue of the Journal.

research and to give it out without twist or bias.

The discussion resulted in the adoption of the following motions:

1. That it seemed desirable to take steps leading to the establishment of a coördinating agency in the general field of personnel research.

2. That the first duty of such an agency would be to secure and disseminate information with regard to present agencies and the work which they are doing and have done: also a statement of the material which exists and the available sources of information.

During the afternoon the various committees on organization prepared their respective reports. These were received in the evening. The work of these committees suggested the general form of organization and the main features of the constitution of a personnel research federation. That led to the passage by the Conference of the following motions and resolutions:

1. That in order to help the Federation in its work of bringing about coördination in the field, the United States Bureau of Labor Statistics be urged to undertake a survey of existing agencies and that it issue a bulletin describing their scope, methods and activities.

2. That it was the sense of this Preliminary Conference that a Personnel Research Federation should be established as soon as practicable, and that this organization should have approximately the form recommended by the committees.

3. That the various representatives should submit to their respective organizations a report of the Preliminary Conference and a statement regarding the proposed organization, and that he report back to the National Research Council's Committee on Industrial Personnel Research the action of his organization.

The Conference was then adjourned, subject to the call of the Chairman for a second meeting in about sixty to ninety days.

The success of the Preliminary Conference was due in large measure to the wise counsel and generous help given the Committee by many persons both within and outside the organizations invited to participate. But for a small donation made by the Commonwealth Fund to provide for necessary expenses, the Conference would not have been possible.

THE SECOND CONFERENCE—ORGANIZATION

It was unfortunate for the proposed organization that Dr. H. A. Bumstead, who had served as Chairman of the Preliminary Conference, died during the winter months. Dr. W. V. Bingham, however, acting as Chairman of the Committee on Industrial Personnel Research maintained the National Research Council's active interest in an organization. He and Mr. Flinn of Engineering Foundation continued, during the winter, to survey the situation and to ascertain what and how many organizations would be interested in membership in the permanent organization. After thus reviewing the field, it seemed advisable to call a Second Conference on March 15, 1922.

This Conference met on the appointed day in the building of the National Research Council. Dr. W. V. Bingham was elected Chairman. Dr. J. David Thompson presented in preliminary form the report on "Agencies Engaged in Personnel Research"

which he had undertaken for the Bureau of Labor Statistics at the request of the First Conference. This showed that there were a great number of organizations conducting some phase of personnel research and that they represented a very considerable diversity in type of organization.

The secretary reported that of the organizations that had attended the previous conference and that had been questioned as to their membership in a permanent organization, fourteen approved the plan and three only had positively declined membership. Six organizations expressed themselves as willing to join at once. Othres were embarrassed by the question of finance. Encouraged by this news the Conference resolved to proceed with the formation of a Personnel Research Federation along the lines suggested by the November Conference.

Before the close of the meeting the constitution and by-laws had been adopted.[3] The following organizations became the charter members of Personnel Research Federation.

National Research Council:
Research Information Service.
Engineering Foundation
American Federation of Labor
Bryn Mawr College:
Carola Woerishoffer Department of Social Economy and Social Research.
Bureau of Industrial Research
Carnegie Institute of Technology:
Bureau of Personnel Research.
National Committee for Mental Hygiene
University of Pennsylvania:
Department of Industrial Research, Wharton School of Finance and Commerce.

[3] These are reprinted as appendices to the present report on page 14 of this issue.

Officers of the Federation were elected as follows:

Chairman: Robert M. Yerkes
Vice-Chairman: Samuel Gompers
Secretary: Alfred D. Flinn
Treasurer: Robert W. Bruere

Dr. Beardsley Ruml was appointed Acting Director.

Some time was devoted to discussion of plans of the Federation and methods of carrying on its work. The Chairman was questioned as to a proposed Journal of Personnel Research. He had personally been interested in such a journal and had opened negotiations with a publisher. He felt, however, that the journal should properly be undertaken by an official organization, when such should appear on the field.

It was the sense of the meeting that the Federation should make a useful though modest beginning by serving chiefly in the following ways:

1. At once establish some correlation among personnel research workers.
2. Establish itself as a going concern and as one in a position to receive funds for the prosecution of its work.
3. Carry on and perpetuate the interest in personnel research that had originated in Engineering Foundation and National Research Council.
4. Place finally authority and correlation of research in the hands of a body properly representative of interested organizations.

The Federation resolved to carry on this work in so far as possible, adjusting itself to the funds available.

FIRST ANNUAL MEETING—NOVEMBER 21, 1921

Sometime after the spring meeting, Dr. Beardsley Ruml, the Acting Di-

rector of the Federation, was forced, by pressure of other duties, to resign his position in the Federation. He continues, however, to maintain his interest in it and to assist the officers of the Federation by advice and counsel. During the spring and summer months, the Federation looked over the field and fulfilled the first of its functions in collecting information on studies in progress, and in keeping in touch with research organizations. It answered enquiries regarding developments in personnel and acted as an informal advisor on certain projected researches.

In the fall, Mr. Leonard Outhwaite began serving as Acting Director. Plans were made for an anniversary meeting in November, and the membership of the Federation was extended by issuing invitations to a carefully selected list of organizations and individuals.

The first annual meeting took place November 21, in Washington, in the building of the National Research Council. This meeting was attended by over fifty persons, twenty-five of whom represented memberships in the Federation. Dartmouth College and The Bureau of Vocational Information constituted two new active memberships. Four government organizations had availed themselves of the opportunity to become coöperating members. These were

United States Bureau of Labor Statistics
United States Bureau of Mines
United States Civil Service Commission
United States Public Health Service

There had also been added as coöperating members, the following universities:

Harvard University,
Bureau of Vocational Guidance
Harvard University,
Graduate School of Business
Northwestern University
University of Chicago
School of Commerce and Administration

The Secretary's report showed the following classification of memberships: Charter members, 8; new members admitted today, 17; total membership 25, classified as follows: Voting 10; Coöperating, 14; Sustaining, 1.

After the new members had been elected and welcomed to the meeting, Dr. Robert M. Yerkes, as Chairman, read the opening address. He outlined the general purposes of personnel work and particularly the work of personnel research. He spoke of the historical development of industry and of changes in the work and the worker that have accompanied this development. He showed that such research is an important element in improving work and working conditions and in making industry serve human satisfaction.

Dr. J. David Thompson announced the completion of his report on "Organization in the Personnel Research Field." This report was the result of the survey that had been undertaken at the request of the Preliminary Conference. It was just off the press as Bulletin 299 of the United States Bureau of Labor Statistics. By courtesy of Commissioner Ethelbert Stewart advance copies were distributed to those present at the meeting. Dr. Thompson explained that it had been his object to provide a nucleus of information about agencies conducting research relating to personnel. Such a

nucleus, he thought, would aid in the correlation of their efforts and would be a starting point of the Federation. He recognized that the work was not complete nor entirely accurate but that it could be corrected and extended by the Federation itself. The term "personnel research" had been broadly construed so that the bulletin might be useful to a variety of people and agencies.

Dr. C. S. Yoakum of the Bureau of Personnel Research, Carnegie Institute of Technology, presented a paper on "Basic Experiments in Vocational Guidance."[4]

Joseph W. Hayes of the Scott Company, Philadelphia, Pa., read a report on "An Experimental Study on Retardation in Relation to Satisfaction on the Job in a Metal Manufacturing Plant." He spoke of the use of mental alertness tests and of school retardation as a rough indication of mental alertness. He showed the need for an analyzing statement about turnover and satisfaction on the job, not only by factory department and by occupational group but also by levels in mental alertness and school retardation.

Dr. L. L. Thurstone reported the methods employed and the results obtained in his extensive study on the selection of students for engineering training. A series of selective tests was contrasted with the traditional form of engineering examination. A series of the tests required less time for their performance and showed a greater diagnostic reliability.

Recess was taken from 12:30 to 2:00 p.m., during which luncheon was served.

A report on "Posture in Occupations as Related to Health," was presented in an informal discourse by Dr. L. R. Thompson, of the United States Public Health Service.

Dr. R. R. Sayers, of the United States Bureau of Mines, made a statement on the "Determination of Carbon Monoxide in the Blood, and Its Effects on the Worker," and spoke informally of his own experiences.

President Samuel Gompers, of the American Federation of Labor, being absent on account of attendance upon the Conference on Limitation of Armaments, Vice-President Matthew Woll read an address for him on "Problems of Personnel Research of Interest to Organized Labor," and supplemented it with a pamphlet entitled "Wages," in which important principles of the fixation of wages are discussed.

"Difficulties Encountered in a Cause-of-Leaving Research" constituted the subject of an address by Miss Anna Bezanson, of the Wharton School of Finance and Commerce, University of Pennsylvania.

All the papers and addresses were valuable contributions to knowledge of personnel in industry, commerce and education, and several of them brought out interesting discussion. It was the consensus of opinion at the meeting that they should be published as completely as resources would permit.

Representatives present were then asked for brief statements on "Researches in Personnel in Progress and Planned" for 1921–1922. Sixteen or-

[4] This paper appears on page 18 of this issue.

ganizations reported work in hand or proposed. The following subjects are examples:

Job Analyses of Managers
Interest Analyses, Will-Temperament Traits and Vocational Aptitudes
Selection, Training and Supervision of Salesmen
Prediction of Success for Comptometer Operators
Causes of Leaving
Organization of Work in the Bituminous Mines with Special Reference to Personnel Problems
Occupational Description of Faculty Position in a Large University
Methods of Organizing Personnel Work for a University
Women in Trade Unions in Philadelphia
Methods of Industrial Training
Women in Chemistry
Studies in Hygiene and Safety in a Variety of Industries

Officers for the ensuing year were elected as follows:

Chairman—Robert M. Yerkes, National Research Council
Vice-Chairman—Samuel Gompers, American Federation of Labor
Secretary—Alfred D. Flinn, Engineering Foundation
Treasurer—Robert W. Bruere, Bureau of Industrial Research
Director—Leonard Outhwaite, Columbia University
Executive Committee
Robert M. Yerkes
Alfred D. Flinn
W. V. Bingham
Emma P. Hirth
Frank Morrison

The general meeting was succeeded by a meeting of the Board of Governors. This meeting considered ways and means, and the projected work of the Federation for the year. It also appointed a committee to act on the possibility of establishing a Journal of Personnel Research, a suggestion which had first been broached in the organization meeting. This committee later reported favorably upon the project and was authorized to complete negotiations with the publisher.

For the time elapsed the progress reported may appear small. Nevertheless, it is believed that more has been accomplished than appears on the surface. The sponsors of the Federation have preferred to make lasting rather than rapid progress. Their inspiration from the beginning and their abiding purpose is to bring benefit to the *whole* community by substituting research for controversy, fact for assumption, and the dispassionate spirit of Science for the self-seeking of partisanship, in all the relationships and circumstances of men and women at work in industry, commerce, education and government.

PERSONNEL RESEARCH FEDERATION

CONSTITUTION

ARTICLE I. NAME

The name of this organization shall be Personnel Research Federation.

ARTICLE II. OBJECT

The object of Personnel Research Federation shall be the correlation of research activities pertaining to personnel in industry, commerce, education, and government, wherever such researches are conducted in the spirit and with the methods of science:

To this end, Personnel Research Federation will

a. create a clearing house for information pertaining to research agencies in the field of personnel, the scope and facilities of such agencies, and researches already completed or in progress;

b. study whether and to what extent research effort may be harmonized, duplication minimized, neglected phases of the problem considered, and advanced work undertaken;

c. formulate a comprehensive general plan through which research activities may be correlated and in accordance with which future work may develop.

ARTICLE III. MEMBERSHIP

Section 1. Personnel Research Federation shall be composed of four classes of members:

1. Voting
2. Coöperating
   - a. Government agencies
   - b. Educational institutions
   - c. Associations
   - d. Corporations
   - e. Individuals
3. Sustaining
   - a. Individuals
   - b. Corporations
   - c. Associations
4. Patrons
   - Individuals, corporations or associations

Voting members shall be scientific, engineering, labor, management, employer, educational and other organizations engaged in personnel research which subscribe to the policies of the Federation.

Coöperating members shall be individuals and organizations contributing results of research they may conduct and supporting the Federation, who subscribe to the policies of the Federation.

Sustaining members and Patrons shall be organizations and individuals who may or may not be engaged in personnel research but who contribute to the financial support of the Federation.

Section 2. All members shall have the privilege of attending the general meetings of the Federation, in person in the case of individuals, and by duly designated representatives in the case of organizations; but only the Voting and Coöperating members shall participate in discussions and only the Voting members shall have the power to vote. All members shall be entitled to receive regular publications of the Federation.

Voting and Coöperating members are expected to

1. conduct and encourage research in their several fields in so far as may be practicable;

2. supply to the Federation for circulation among its membership reports of such research as may be conducted by them:

3. coöperate helpfully with other members of the Federation in giving information and counsel with respect to researches which may be in progress or proposed.

ARTICLE IV. DUES

The yearly dues of the several classes of members shall be as follows:

1. Voting Members	$100.00
2. Coöperating Members:	
(a) Governmental agencies, no dues for those agencies prevented by legal restriction from paying such dues; other governmental agencies	50.00
(b) Educational institutions	15.00
(c) Associations	50.00

(d) Corporations..... $50.00
(e) Individuals..... 5.00

3. Sustaining Members
(a) Individuals..... 100.00
(b) Corporations..... 250.00
(c) Associations..... 250.00

4. Patrons
individuals, corporations or associations... 500.00

or more, as may be volunteered by each patron.

ARTICLE V. MANAGEMENT

Section 1. The Federation shall be governed by a Board of Governors comprising one representative designated by each voting member organization.

Section 2. The Board of Governors shall be vested with the exercise of all powers of the Federation, subject to this constitution. It shall make provision in by-laws for the general administration of the affairs and property of the Federation.

Section 3. The Board of Governors shall determine from time to time in a general way what work is to be undertaken on behalf of the Federation and shall set the limits for expenditures.

ARTICLE VI. OFFICERS

Section 1. The officers of the Federation shall be a Chairman, a Vice-Chairman, a Secretary, and a Treasurer, who shall be chosen annually by the Board of Governors and who shall perform the usual duties of these officers, and such other duties as may be assigned by the Board of Governors. These officers shall also be officers of the Board of Governors and may or may not be members thereof. If not members of the Board, officers shall have no vote.

Section 2. The Board of Governors shall designate an Executive Committee consisting of the Chairman and the Secretary ex-officiis, and three additional members. The Executive Committee shall have all powers of the Board of Governors between meetings of the Board, provided all actions of the Committee are subject to telegraphic or letter referendum by the Board of Governors.

ARTICLE VII. ADMINISTRATIVE STAFF

Section 1. The Administrative staff of the Federation shall consist of a Director and the necessary assistants. The Director shall be appointed by the Board of Governors, and his assistants shall be engaged by the Director.

Section 2. The Director shall be ex-officio a member of the Board of Governors and of the Executive Committee, without vote.

ARTICLE VIII. COUNCIL OF TECHNICAL ADVISERS

A Council of Technical Advisers is authorized, to consist of expert and professional persons competent in various fields, invited by the Board of Governors to give information and counsel on questions referred by the administrative officers. Technical advisers shall serve without fee. Their number and term of office shall be fixed by the Board.

ARTICLE IX. AMENDMENTS

This Constitution may be amended by a two-thirds vote of members attending a regular meeting of the Board of Governors, provided the amendment has been submitted to all voting members at least one month in advance of the meeting.

Approved by the Board of Governors, April, 1921.

BY-LAWS

ADMISSION, SUSPENSION AND EXPULSION OF MEMBERS

1. An organization or individual engaged or interested in personnel research may apply for any appropriate class of membership, using a form to be supplied by the Federation. Applications shall be considered by the Board of Governors in such ways as it may determine and shall be submitted to letter ballot of the members of the Board within three months from dates of receipt. The Board shall determine the class of membership of each applicant. Admission to voting membership shall be void if, within three months

after election, National Research Council or Engineering Foundation or any voting member file with the Board of Governors written objections, with the reasons therefor, convincing to the Board. Otherwise the affirmative vote of the majority of the members of the Board shall admit an applicant to any class of membership.

2. Each applicant admitted to membership shall be duly notified, and those admitted to the Voting or the Coöperating class shall subscribe to the constitution and policies of the Federation in forms provided by the Board of Governors. If conditions for admittance are not fulfilled within six months, election shall be void. Membership shall date from day of election.

3. Any member may be suspended or expelled by the Board of Governors, after written notice and due opportunity to reply, for delinquency of more than one year in payment of dues, or for actions seriously prejudicial to the welfare of the Federation, if not less than two-thirds of the members of the Board vote affirmatively.

PAYMENT OF DUES

4. Dues shall be payable annually in advance on October first, to the Treasurer. Applicants for membership shall pay their first dues upon notification of election; but applicants admitted after six months of the fiscal year shall have expired shall pay only one-half of the annual dues for that year.

BOARD OF GOVERNORS

5. The term of office of each representative of a voting member shall be two years. Approximately one-half the voting members shall designate their representatives upon the Board of Governors on the even-numbered years and the other half on the odd-numbered years. At the beginning, those voting members designating on the even-numbered years, to be determined by lot, shall designate their members for one year only. Re-designation to the Board of Governors shall be at the discretion of each member organization. Any voting member may recall its representative at any time.

6. The Board of Governors shall meet in Washington annually in October, and at other times at the call of the Chairman or upon the request of five members of the Board.

7. A quorum of the Board of Governors shall be one-third of its membership.

8. Meetings of the Executive Committee shall be called by the Chairman, upon the request of three members of the committee.

ELECTION, REMOVAL AND BONDING OF OFFICERS

9. Officers of the Federation and members of the Executive Committee shall be elected by letter ballot, and the affirmative vote of a majority of the Board of Governors shall be necessary in order to elect. A vacancy in any office shall be filled by the Board of Governors in the same manner. A committee of not less than three members may be appointed by the Chairman not less than four weeks before the date of the annual meeting, to nominate officers and members of the Executive Committee for the following year; but voting shall not be restricted to the nominees of this committee.

10. Any officer of the Federation may be removed at any time by the affirmative vote of a majority of the Board of Governors.

11. The Board of Governors may require the Director or any officer, in its discretion, to give the Federation a bond in such amount as the Board may require, at the expense of the Federation, with sureties satisfactory to the Board, for the faithful performance of the duties of his office and for turning over to the Board all books, papers, vouches, records, money and other property of whatever kind belonging to the Federation that have been in his custody.

COMMITTEES

12. Committees for the study of any subject within the province of the Personnel Research Federation shall be authorized by the Board of Governors. The members of a committee may be selected by the Director, with the advice and consent of the Chairman of the Federation. Membership in these committees is not limited to members of the Federation.

DIRECTOR

13. The Director shall devote such portion of his time to the work of the Federation as may be covered by the terms of his engagement. He shall serve as the executive officer of the Federation and conduct the ordinary business of its office. Under the general authority of the Board of Governors, the Director shall promote the objects of the Federation as stated in the constitution, and within authority granted may initiate and carry out operations necessary or desirable therefor.

14. The Director shall have authority, subject to the general control of the Board of Governors, to determine the ways and means which he shall use in performing the work assigned to him by the Board, provided he does not undertake expenditures in excess of the funds provided in the budget or by special appropriation.

15. The compensation of the Director shall be fixed by the Board of Governors. Within the budget allotment, the Director may fix the compensations of his assistants.

SECRETARY

16. The Secretary shall keep a record of all proceedings of the Federation, its Board of Governors, and the Executive Committee, and shall send a copy of the record of each meeting to each member of the Board of Governors.

17. Notices for general meetings of the Federation, and for the meetings of the Board of Governors shall be mailed by the Secretary not less than 15 days in advance of the date of the meeting. Notices for meetings of the Executive Committee shall be given by mail or wire not less than 24 hours in advance of the time of the meeting.

18. The Secretary shall notify each member of the amount of the dues for the the ensuing year, at the time of giving notice of the annual meeting.

TREASURER

19. The Treasurer shall receive and safely keep all moneys paid to him for dues or otherwise for the purposes of the Federation. He shall deposit the funds in the name of the Personnel Research Federation in a bank acceptable to the Board of Governors and shall sign all checks drawn upon said funds.

20. The Treasurer shall make payments only on vouchers approved by an officer of the Federation or by the Director, which are in accordance with the annual budget or other authorization of the Board of Governors.

21. The Treasurer shall establish a petty cash fund for the Director, in an amount to be determined by the Board of Governors and shall replenish it from time to time upon submission by the Director of proper vouchers.

BUDGET

22. The Director shall submit to the Board of Governors annually, not later than August 1, a tentative budget of anticipated income and proposed expenditures for the year beginning October 1 next ensuing. Provisions shall be made separately for the administrative staff and for the necessary expenses of each officer. The budget, after amendment and adoption by the Board of Governors, shall control the financial operations of the Federation, excepting as otherwise authorized by the Board.

23. No obligations or bills shall be contracted for the Federation, nor shall contracts be made in its name, unless authorized by the Board of Governors.

AMENDMENTS

24. The Board of Governors may amend these by-laws at any meeting at which a quorum is present, by a two-thirds vote of those present, provided the amendment shall have been mailed to each member of the Board not less than three weeks before action is to be taken. Any member unable to attend the meeting may send a letter ballot.

Approved by Board of Governors, April, 1921.

Basic Experiments in Vocational Guidance

By C. S. Yoakum, *Carnegie Institute of Technology*

VOCATIONAL guidance is a current term in industrial, commercial and educational circles today. The vestibule schools in large industries, in banks, in commercial houses and in insurance companies, are seeking means of directing the energies of young people that are working for them, into channels that will be more profitable to their concern and will utilize these energies to the advantage of the individual. Correspondence schools, Y. M. C. A.'s, Federal agencies, private foundations, individuals, and even corporations organized for gain are openly engaged in advising young men and women in regard to to their life work and in recommending courses of study to prepare them. Some of these even advertise extensively for clients.

The services offered vary. In certain schools, the work consists in interviewing students who make poor grades, in analyzing the reasons therefore and in making suggestions that are intended to improve these students' class work. When improvement fails to appear they are authorized to change the course of study pursued, and in aggravated cases to recommend reduction in amount of formal training, or immediate preparation for a job. In other instances, this service is extended to advising any student concerning future occupations and concerning the preparation necessary. The industrial and commercial concerns usually limit such service to advice that deals with the analysis of difficulties in the present position, better preparation for the present job and courses of study that lead to better paid positions.

The vocational adviser, to summarize, advises that courses of study be changed, that the student direct his attention toward one objective rather than another, that the individual endeavor to develop some traits of character and not others. He points out the mental capacity to perform certain acts and the inability to perform others. He assumes some degree of knowledge concerning the qualities required to succeed in a particular occupation and some power to detect the presence or absence of these qualities in the one seeking such advice. It is here, in our opinion, much experimental work awaits before the vocational adviser is supplied with satisfactory tools for his work. What is the nature of the tools we must shape for this task?

If we examine this problem more closely, we find three lines of investigation by which the approach to its solution must be made. In the first place, it is necessary to determine the nature and content of the job. Second, we must determine the capac-

ities and characteristics of the satisfactory and satisfied workers on the job as distinguished from the traits and capacities of those who are not satisfactory and satisfied. We must also discover here such traits as are essential to the job or groups of jobs that are not possessed, or not possessed in the same degree, by workers on other jobs. Third, we must determine which capacities and qualities of the younger generation we expect to advise will develop into such traits and characters as we find are in those who are satisfied and satisfactory workers on the job.

I have mentioned as the first general problem to be solved, the necessity of determining the nature and content of the job. To place an adult with experience and training on a suitable task requires perhaps less detailed information and acumen than it does to guide the youth who is seeking a life occupation, into the right channels. I am not sure. When I observe the high turnover in many occupations the continual seeking for new opportunities by men and women who have jobs, the unrest and complainings of those who do not even plan a change, it seems to me that there is much yet to be done for the adult worker. The other phase is illustrated by those who have not considered selection and placement a problem. A man high in authority in a company, employing men by the tens of thousands said recently, "Your work on selection may be of great value to small companies that must be careful of their personnel, but with us it is simply a matter of hiring a large number of those applying for work and culling them out on the job." When I listen to such remarks and to to the florid advertising of self-styled character analysts who would direct our young people into the occupation "for which they are exactly suited," I am, to put it mildly, astounded at the lack of vision displayed on the one hand, and at the prophetic vision claimed on the other. It behooves us who have some vague premonitions of these dangers, to seek and to set forth more accurate knowledge of human work and human capacity.

Accurate knowledge of occupations, of the capacities required and of the type of training necessary, can be obtained. Among other things it will involve (1) the development and improvement of the method of job analysis, (2) the definition of degrees of responsibility, (3) the setting forth of lines of promotion with the search for collateral opportunities, (4) the statement of the knowledge required, together with the amount of preparation needed to begin as an apprentice and the method by which such knowledge and training can be obtained.

Preliminary steps have been taken on some of these large and important investigations. Others do not even have their outlines in distinguishable form. We speak, for example, quite easily of "failure to accept responsibility," of the inability to do so, of the eagerness of others to seek it; yet its relative degrees and its nature at different levels of development, of training, of experience are not known to us. The power to exercise responsibility, to take the initiative within the limits of an order or instruction or set of rules that is shed upon one by his superior officer, is also an unmeasured quantity.

Yet it is partly capable of being set forth within the limits of the job specification itself. Undertake to arrange any pile of job specifications by degrees of responsibility and you will see what I mean. After they have been obtained in the best manner we now know, it requires much discussion by the executive committee of any organization to give them even the semblance of order. If we use salary as a single range is far greater. Below is presented a chart (chart 1), indicating the situation in an actual organization. The range of salary of persons exercising degree of responsibility X as determined by the major officials, shown, for example, in class G, is from $700 per year to $2500 per year.

No one would claim completeness for this chart. It disregards among other things, years of experience,

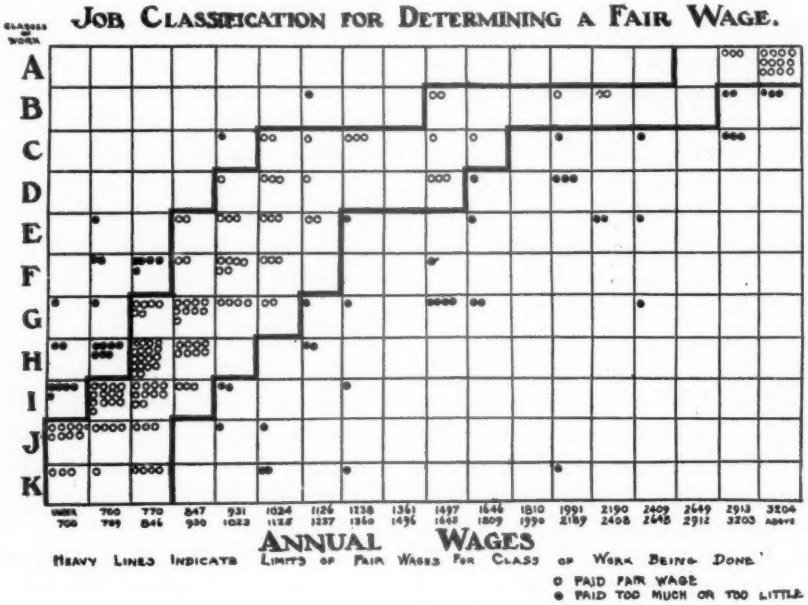


CHART 1

measure of such successful arrangement, we find the following: The salary range of tasks placed as equivalent in degree of responsibility is often from $15.00 per week to $50.00 per week; in another instance the range of wages for similar unskilled tasks within a city of 40,000 inhabitants is from 18 cents per hour to 35 cents per hour. If we introduce the elements of experience and length of service, the length of training, conditions of work, hours of labor, temporary or permanent character of each position, opportunity for promotion, supply of workers available, the personality of the worker, and the personal relationship of workers. Notwithstanding, it focuses attention on two important items and enables us for the moment to concentrate on an important relationship. No one who has sat with

wage adjustment committees would for an instant deny the importance of just such detached and impartial methods of presenting facts.

It is a distinct advance in method to be able to arrange a consensus of opinion regarding degrees of responsibility in objective form. The consideration of mal-adjustment in wages, in duties, in other conditions of work, would be greatly facilitated by similar careful investigations of the facts. Many types of data that should be statistically and graphically related before decisions are made, are to be found in every industrial and commercial concern. By bringing together three such methods of research, we were recently able to aid an official to put before some twenty of his managers the relations of salary to responsibility and these to efficiency, and to show them the necessary adjustments that would stop an unusually large turnover in a skilled occupation.

This sketchy illustration must suffice to point out the fundamental importance of research on the numerous and disputed conditions of work and the nature of the rewards involved in each occupation. Some progress has been made in each of the four fields indicated above. Let us turn to the researches that investigate the capacities and characteristics of the worker.

In regard to human differences, much work remains to be done. It is, in our opinion, an important field of investigation and one that is fundamental to vocational guidance. Certain "general facts about individual variations in traits taken one at a time, seem highly probable. (1) The variations are, in general, greater in acquired than in original traits. (2) They are, in general, greater in traits peculiar to man than in traits characteristic of all mammals. (3) The variations are usually, perhaps always, continuous. . . . . (4) The variations usually cluster around one central tendency or 'type.'" [1]

Many of the variations in human traits either have no importance for occupations or we have not yet discovered their significance. In other cases, proof is still wanting to demonstrate scientifically the truth of opinions and "hunches" regarding the variation that has a high relation to success in various jobs. I am frequently moved to offer an apology when I refer to phrenology and such forms of character reading, but not long ago I met a sales manager who had solved his problem of selection. He selected for salesmen only those applicants with sharp noses! Though he cannot seem to get enough applicants six feet or more in height, another sales manager persists in a thrill of joy when he does get one, for he feels sure here is a man with the proper traits for selling the company's product. The fact that his short and medium and tall men of one level of intelligence were leaving his employ and his short, medium and tall men of another level of intelligence stayed with him 10, 15 and 20 years as salesmen did not seem to spoil his joy in the few tall men who had succeeded.

The careful investigator cannot accept any belief as a basis for vocational guidance without definite proof. It is possible to use data on individual

[1] E. L. Thorndike, *Educational Psychology*, iii, 317.

variations to establish such proof. A few illustrations will show that these variations in human traits do exist. Experimentation is needed badly to find those that are fundamental for satisfactory work in various occupations.

Chart 2 will show the differences between individuals as regards height.[2] The curve given also shows the way these differences are distributed. It

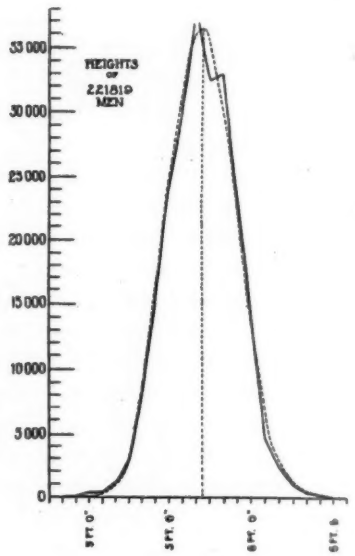


CHART 2

illustrates point 4, where we said the variations usually cluster around one central tendency. There are many more persons of what we call average height than of the very short or very tall. The variations shown here are, however, much less than variations in the mental qualities as shown in the following table compiled by Dr. Walter Dill Scott.

[2] Quoted from note by E. G. Boring in *Science*, N. S., lii, Nov. 12, 1920, 464, 465.

TABLE 1
Individual differences

	POOREST	AVERAGE	BEST
1. Height	53	62	70
2. Weight	57	90	146
3. Strength	15	29	48
4. Reaction time	210	163	130
5. Learning a maze	54	33	21
6. Reproduction of pitch	5	2.3	0.9
7. Substitution test	286	157	82
8. Judgment of rhythm	0.23	0.05	0.02
9. Memory for digits	17	70	100
10. Opposites	8	80	100
11. Puzzle box	720	304	45
12. Ingenuity (matches)	35	10	1
13. Mental alertness	0	70	210

Table 1 brings together for comparison individual differences in physical, sensory and higher mental traits. Though we have no satisfactory way of comparing the amounts of these differences, it is highly probable that the individual variations are much greater in the higher mental traits. Certainly we cannot depend on a variation between two individuals in height or strength or memory for digits to tell us what differences exist between them in ingenuity or mental alertness. The problem for vocational guidance resolves itself into finding those variations in human traits that represent similar degrees of variations in occupations. Increasing knowledge of all forms of variations in capacities and in acquisitions will gradually give us the requisite information for adjusting these to occupational demands.

Below is given a table (table 2)[3] showing how eighth grade pupils,

[3] Quoted from Thorndike, *Educational Psychology*, iii, 1914, 147.[1]

pupils with presumably equal opportunity to learn addition, differ in number of problems added in a given time. From the table we see that 31 pupils added 19 problems in 12 minutes; 497 added 10 problems in the same period: and 30 pupils completed only one problem in 12 minutes. Here we have a wide variation in an acquired trait.

TABLE 2

The variation among eighth grade pupils in arithmetical computation

"SCORE" OR "QUANTITY": EXAMPLES DONE CORRECTLY IN 12 MINUTES IN THE CASE OF TEST 7	NUMBER OF CHILDREN MAKING EACH SCORE OR "FREQUENCY": EIGHTH GRADE CHILDREN IN NEW YORK CITY
19	31
18	25
17	86
16	107
15	182
14	251
13	327
12	390
11	453
10	497
9	475
8	425
7	333
6	312
5	339
4	152
3	88
2	71
1	30
0	28

Working conditions and occupational differences involve variations in these various differences in human differences in mental capacity determine roughly the tasks we can accomphish. The knowledge and training we have acquired are prerequisites for entering upon practically all tasks.

If, for example, a task involves working conditions which make it a great deal easier for the tall man to work at it, we should then have a task which requires a selective process on the basis of height. If, on the other hand, the nature of the job necessitates the continued adjusting of small objects or of ideas, as, for example in micrometer measurements or cork sorting or the combining of ideas in advertising, we should not look for differences in height as the basis for selection, but for differences in other abilities more closely allied to the nature of the task. Again, if we were seeking a person to do additions and to begin work immediately, we would perhaps disregard any test for fundamental ability in addition and select those persons who showed in a test like the one illustrated above, that they had high attainment as a result of training in adding.

In the first illustration given, we are dependent upon inherited anatomical differences; in the second, we are probably dependent upon inherited mental differences; in the third, we are seeking definite trained ability. In contrast to the selection problems of the first and the third, we might in the second case select one who had potential ability but was untrained. In the first case we cannot train a man to be taller; in the third, we want some one who can add quickly and accurately *now* without additional practice.

Doubtless one of the greatest differences in human ability is measured by what is commonly known as the Intelligence or Mental Alertness Test. The range here is from some sort of ability which we can perhaps desig-

nate for purposes of illustration as zero mental alertness ("just no ability"), to a degree of ability usually described as genius. Between these two extremes, we have many grades of ability on the test, and conceivably many other variations of mental ability would be brought out if other tests were devised. I shall use the differences in ability as shown by this test to illustrate several uses to which such measurements of differences can be applied.

Chart 3 shows a distribution of approximately 94,000 men, ages 21 to 30, as measured by the psychological examinations in the United States Army.[4] It emphasizes the point that men differ mentally as well as physically. It shows, like chart II, that the great body of men group around the middle point or average. If we could measure accurately any other single trait, it would probably show very similar distributions. Until we can do this on many other traits, we will be working largely in the dark on our vocational guidance program.

Chart 4[5] which follows shows how these various amounts of mental alertness distributed themselves when fitness for different army ranks was considered. Officers have a median score of 139.2 on the alpha examination; the native born white draft has a median score of 58.9 on alpha. On the combined score the officers have an average mental age of 17.26 years; the white draft, a mental age of 13.08 years. This selective process is further shown in the curves for officers' training camps and for sergeants and corporals. The use of this single test facilitated placement at several important points in training the National Army.

One of the striking secondary studies that came from the mental testing in the Army was the relationship between the test scores and the civil occupations represented among those tested. The following chart (chart 5)[6] which has been reprinted many times, gives the general relationship mentioned. It is easily seen from this chart that there are several subdivisions which seem to constitute occupational levels. It will also be noticed that similar occupations have similar distributions of intelligence, with medians approximately the same. For example, general auto repairmen, auto-engine mechanics, and auto assemblers are all in the upper part of the C group of occupations. Then in the upper part of the C+ group we have railroad clerks, filing clerks, and general clerks "bunched" together with practically the same median scores. It is also interesting to note that telephone operators fall in the uppermost part of the C group, while telegraphers are well in the middle of the C+ group. Bookkeepers bear the same relation to accountants with the exception that each is in a higher letter grade.[7]

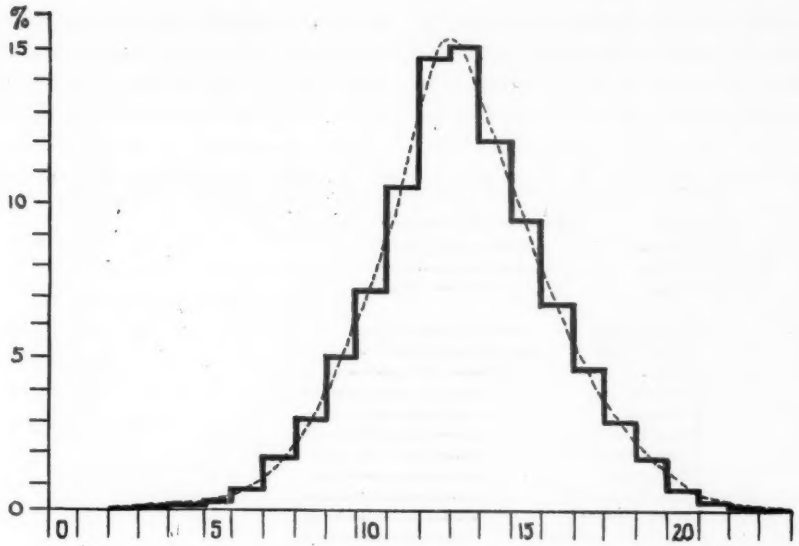
The overlapping of groups constitutes a problem for the investigator of special aptitudes. In our study of salesmen at the Bureau of Personnel Research, we have had occasion to give the Metal Alertness Test to salesmen

[4] *Memoirs National Academy of Sciences*, xv, 1921, 653.

[5] *Science*, N. S., xlix, 252.

[6] *Memoirs National Academy of Sciences*, xv, 829.

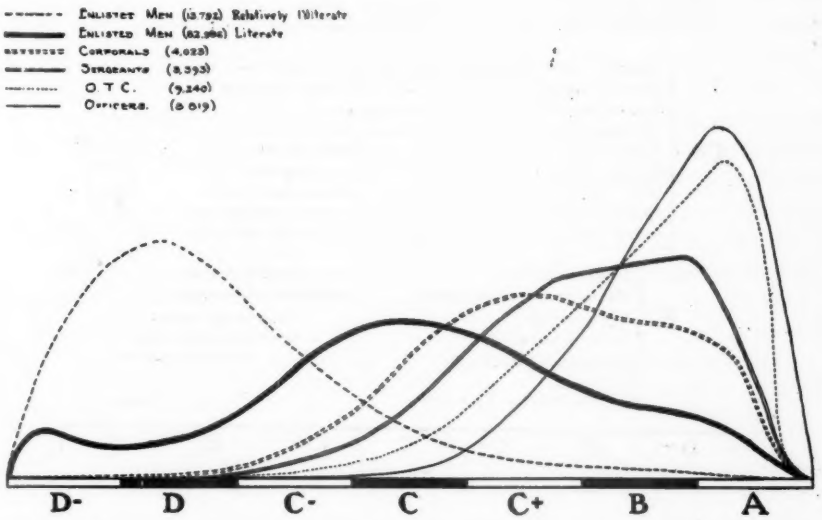
[7] *Memoirs National Academy of Sciences*, xv, 833.



WHITE DRAFT.

INTELLIGENCE DISTRIBUTION: COMBINED SCORE; 93,965 CASES.

CHART 3



THE DISTRIBUTION OF INTELLIGENCE RATINGS IN TYPICAL ARMY GROUPS SHOWING THE VALUE OF THE TESTS IN THE IDENTIFICATION OF OFFICER MATERIAL

THE ILLITERATE GROUP GIVEN Beta, OTHER GROUPS Alpha.

CHART 4

engaged in many different types of selling. A chart indicating the distribution of four of these groups is presented below (chart 6).[8] It will be seen that the term "salesman" is not only used to describe the occupation of people engaged in quite varied tasks, but that it also covers almost the entire range of mental ability. The average score of group A is 51; that of group B, 89; that of group C, 112; and that of group D, 139. It is quite obvious from this chart (1) that a detailed study of the duties of salesmen is necessary in order to reach a proper

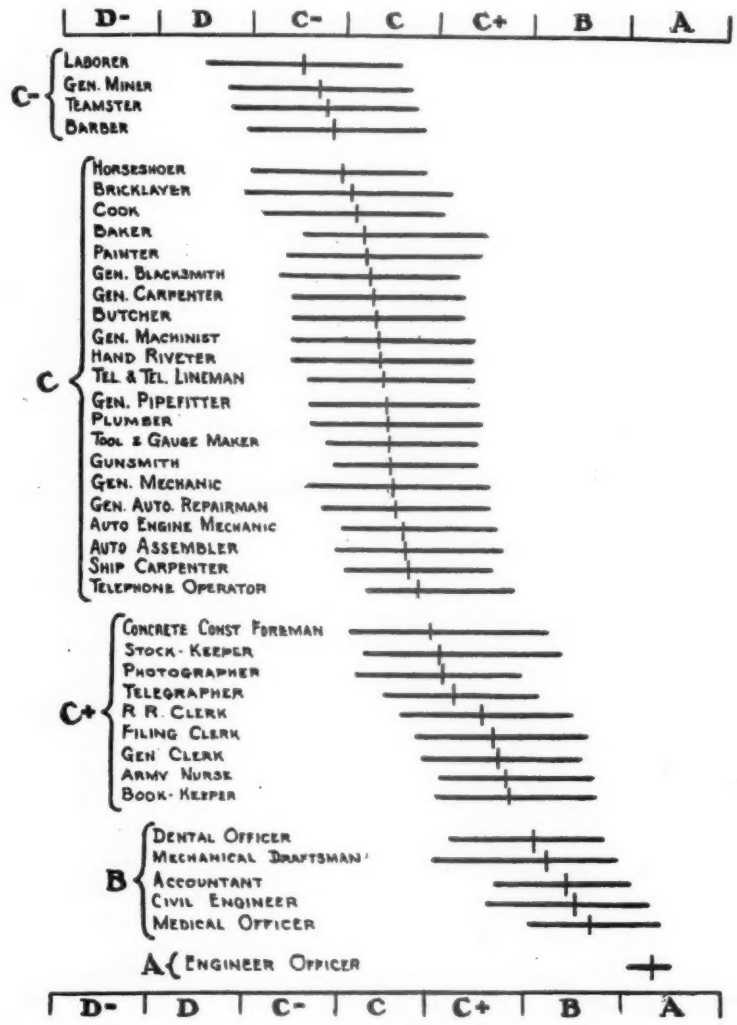


CHART 5

[8] Taken from J. B. Miner, Standardizing Tests for Vocational Guidance, *School and Society*, xiii, 629, 1921.

classification of these widely divergent occupational groups. It is clear also (2) that if a student or young man seeking to change his occupation, were to apply for the job of salesman where he would enter into competition with members of group D, we could quickly give him some hint as to his success if we knew his mental alertness test score. Although the range of ability in each of the groups is wide, there is nevertheless a clear demarcation of group from group as regards the middle 50 per cent of each group.

One hundred and six employees of the Civil Service Commission, who had been selected with unusual care and retained for several months and in many cases for several years, were given group examination alpha. Since unsatisfactory employees would not have been retained it is to be presumed that the group is a competent group. The civil-service ratings, assigned in percentages on the basis of examination at the time of entry into the civil service range from 70 to 94. The median alpha score for this group is 150 with extremes of 199 and 70. For the entire group the correlation of alpha score with civil-service rating is +0.48. For a group of 73 who are classified as clerks, the correlation is +0.53.

In a group of 106 graphotype operators of the Treasury Department, who were tested by the writer in 1919, the median alpha score is 75 with extremes of 11 and 174. The median of the average daily output of plates by this group is 245 with a median error of 2.9 per cent. The highest individual average is 391 plates per day; the lowest, 113 The correlation between output and accuracy is +0.113; between alpha and accuracy, +0.019; and between alpha and output, −0.087. The returns are of special interest in that they exhibit such low correlations between intelligence and accuracy and speed in mechanical work.[9]

[9] *Memoirs National Academy of Sciences*, xv, 837.

The intelligence test score is an excellent measure of efficiency and success in clerical occupations. On the contrary here are three variations within the same group of mechanical workers and no two of them show a relationship greater than that possible by chance. The mental test does not give a significant relationship either with output or accuracy and output does not correlate with accuracy. The operation of these mechanics is not improved in proportion to the intelligence of the workers. There is an evident waste of mental ability in using the highest 26 per cent of the girls on work of this type. The intelligence test also fails us when we try to compare its variations with variations in efficiency of workers who deal with persons primarily.

Since this test was given we have developed new tests that more closely approximate the kind of ability needed to operate these machines and to operate the adding machine. Instead of a minus 0.08 correlation, a recent use of these new tests on operators gives a positive correlation of 0.55. In testing still another group of comptometer operators the following results indicate the success of the tests in prediction:

Failed in tests and failed in course	10
Failed in tests and succeeded in course	0
Succeeded in tests and succeeded in course	20
Succeeded in tests and failed in course	5
	35

This shows a correct choice of 85 per cent.

A combination of two tests that are *not mental alertness tests* enable us to

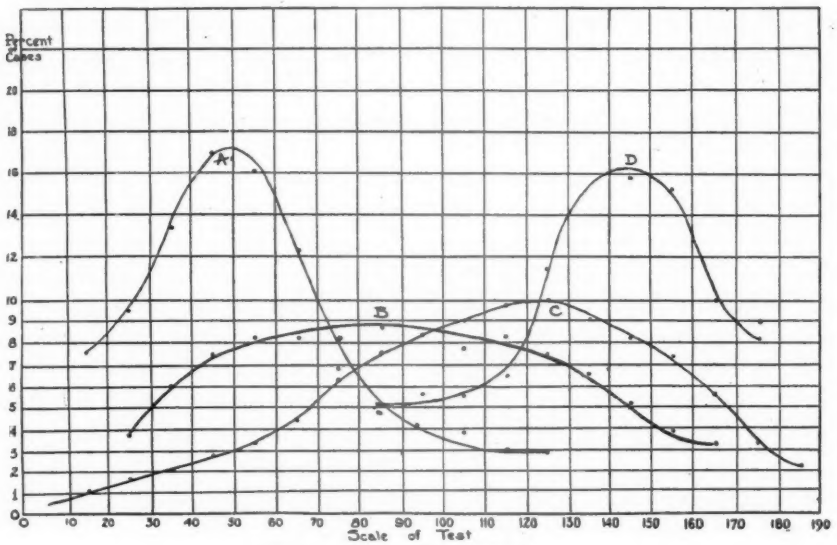


CHART 6

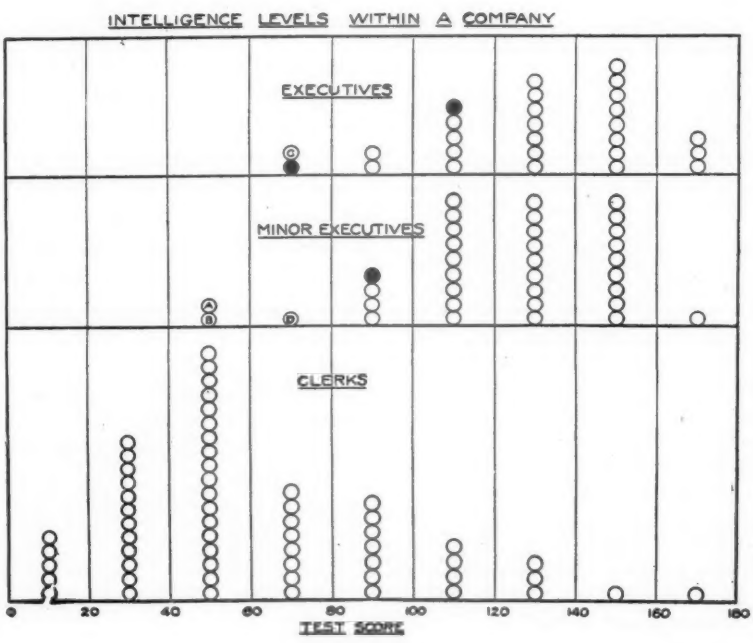


CHART 7

pick successful stenographers with almost 100 per cent accuracy. This method could be used when there is an unusually good supply of stenographic material available.

In studying the possibilities of promotion within certain fields, we can be pretty sure that there are rough limitations from the point of view of mental capacity, that will keep the majority of those who fail to reach the minimum requirements, out of that series of higher positions. An illustration of the range of ability represented within an entire company is given in the next chart (chart 7). Here, an entire company has been given the Intelligence Test and the range of each group is shown in the chart. It is clear, for example, that very few of the clerks and sales people have the ability that will enable them to compete with the higher executives even after years of experience and training. It will also be noticed that a number of the minor executives do not represent the same grade of ability shown by the average of the higher executives. The black dots on the chart indicate those who have left since the test was given because of incompetence or failure.

The principal illustrations given up to this point have dealt with but one characteristic of human beings. It is important to be able to measure other characteristics than mental alertness. The illustration given in the paragraph above, which showed that the graphotype operators were not distributed in output or accuracy according to the intelligence test score, shows us very clearly the need for other methods of selection. In this particular case, we need some measure of ability which will correspond to a rating of successful operator as against unsuccessful operator in both output and accuracy.

Dr. L. L. Thurstone has carried on for a number of years, experiments with different types of these at Carnegie Institute of Technology. In practically all the mental alertness tests, the group of high school graduates entering the College of Industries has had median scores below the median scores of those high school graduates entering the College of Engineering. A test of general knowledge of mechanical things devised by him and given to both these groups, showed that in this respect the industries group of freshmen made as high scores as did the engineering freshmen. In items taken from what is known as the Downey will-temperament test, we find in a number of instances, the industries freshmen doing better than the engineering freshmen.[10]

A table is given below showing these figures.

We have here, then, the beginning of a basic experiment in comparing groups that have elected to be trained in different occupations. In certain directions, notably abstract thinking and manipulation of ideas, one group is significantly better than the other. In knowledge about every day physics and mechanical things the two groups show equal ability. In other directions, particularly manipulative ability with pencil and paper, the second group shows itself to be superior. It is on the basis of such continued, painstaking investigations that we may

[10] Unpublished thesis of L. D. Anderson.

TABLE 3

Differences between two groups of freshmen as shown by testing different traits

TEST	SCORE			FRESHMAN CLASSES
	First quarter	Median	Third quarter	
Thurstone, Test IV	66	80	97	Industries
IntelligenceTest	71	85	102	Engineering
Thurstone, Test VI	55	63	71	Industries
Mechanics Inf. Test	54	62	71	Engineering
Bureau Test IX	69	109	138	Industries
Speed of writing in small space	65	90	124	Engineering
Bureau Test IX	58	74	88	Industries
Rapid Imitation	50	64	82	Engineering

hope to establish reasons for advising a young man to enter one of these groups rather than another. In the writer's opinion, it is only on the basis of such carefully conducted investigations that vocational guidance is possible.

In a large industrial organization, the Bureau undertook to distinguish between students fitted for design engineering and students fitted for sales engineering. By a careful study of those men who were already recognized as highly qualified engineers of each type, we prepared a series of tests and information blanks based on the results of the job analysis and the tests as applied to these two successful groups. On the basis of the interest analysis and the tests selected, the student engineers were divided into sales engineers and design engineers. The accompanying chart (chart 8) in the form of a four-fold table shows that the combined results of two tests quite successfully divided the two types of engineering ability.

An additional blank was used in order to determine the direction of interests of these student engineers. One item of this interest information blank was a list of occupations, selected so as to include an equal number of occupations similar to sales and similar to engineering. These were determined by having a number of engineers and others select those occupations most like the two, selling and design engineering. The student engineers were asked to designate their preference for these occupations in case they had to select a different one from that they were engaged in. Those chosen by the design type of engineer and those chosen by the salesman type are given in the accompanying table (table 4).

TABLE 4

Occupational interests

OCCUPATIONS CHOSEN BY ENGINEERING TYPE	OCCUPATIONS CHOSEN BY SALESMAN TYPE
Architect	Automobile salesman
Automobile repairman	Bank cashier
Carpenter	Editor of popular magazine
Draftsman	Hotel keeper or owner
U. S. government astronomer	Lawyer
Machinist	Newspaper reporter
Pattern-maker	Private secretary
Research worker in physics	Purchasing agent
Toolmaker	Real estate agent
Watchmaker	Stockbroker

In later studies, this experimentation has been carried much further. We have undertaken to measure peoples' interests, their ability to meet people, their temperamental differences, their agressiveness and other traits that may be of importance for success in more personal occupations. The following chart (chart 9) shows that six different types of tests and information blanks have been used in obtaining a distribution of life insurance salesmen that corresponds roughly with degrees of success in selling.[11] The mental alertness test alone gives us absolutely no hint regarding these degrees of success in selling. The next table gives the relative number of times certain parts of these tests or questionnaires were used in the final combination, producing the distribution shown on the chart above.

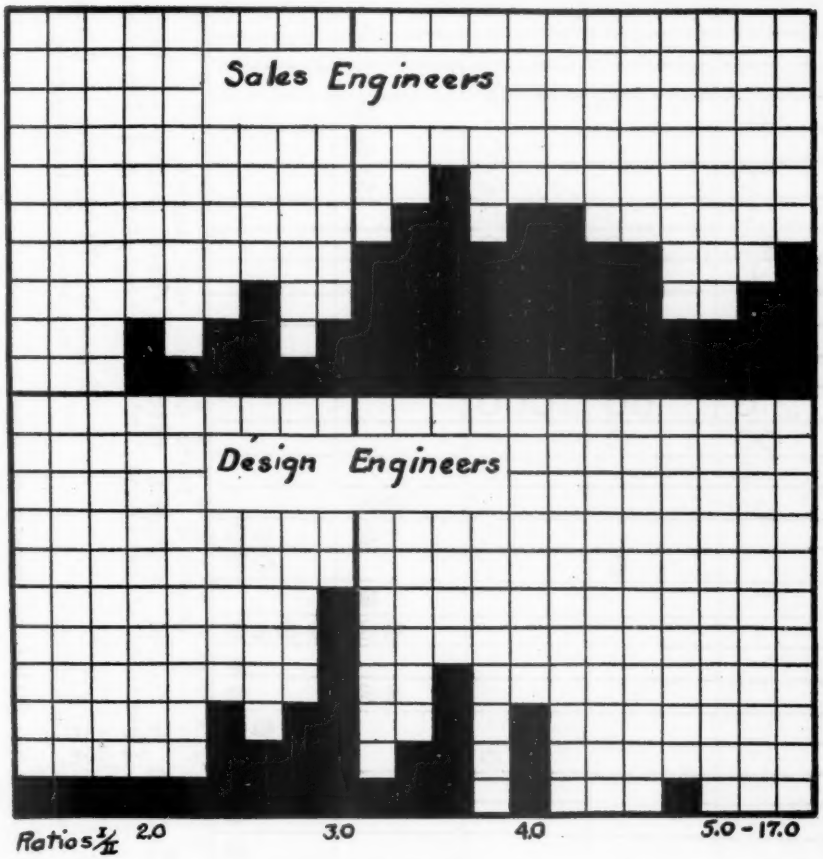
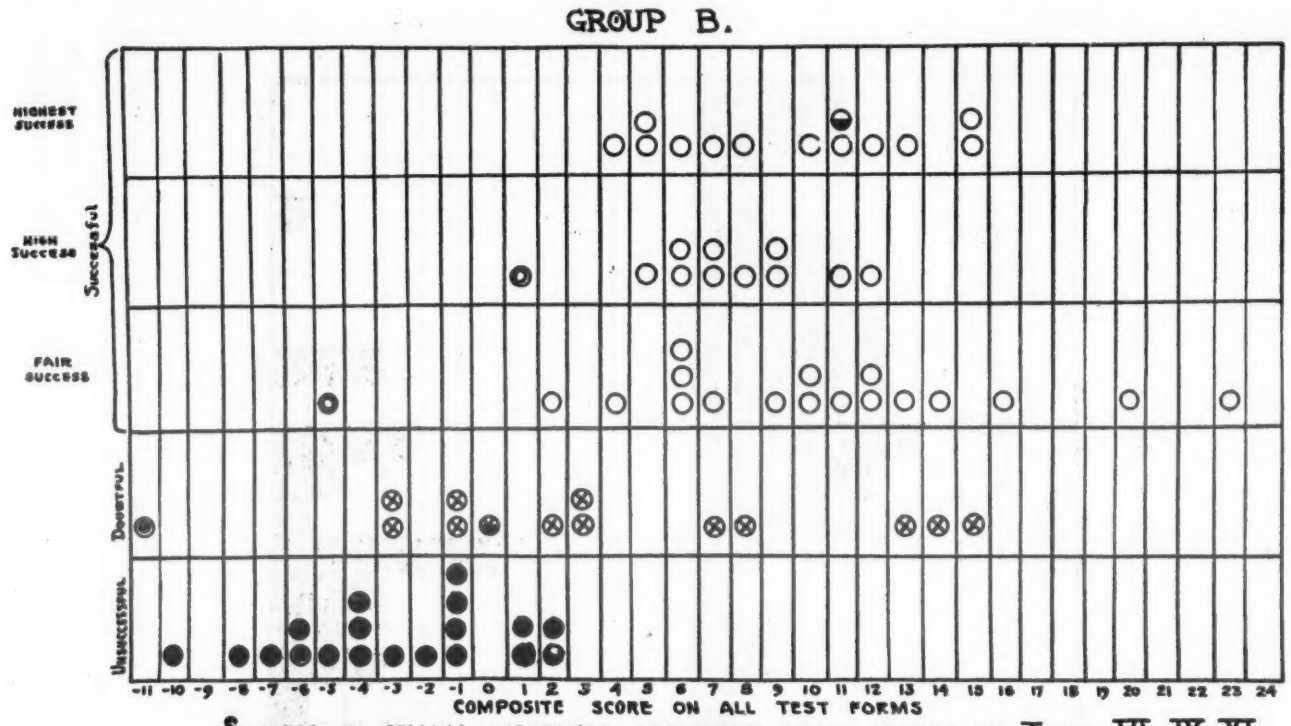


CHART 8

[11] Unpublished thesis of Dr. M. J. Ream.


GROUP B.
HIGHEST SUCCESS
HIGH SUCCESS
FAIR SUCCESS
SUCCESSFUL
DOUBTFUL
UNSUCCESSFUL
-11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
COMPOSITE SCORE ON ALL TEST FORMS

SUCCESS IN SELLING INSURANCE, PREDICTED FROM SCORES IN TESTS VI, IX, XI, Objections to purchase, Interest analysis, and Personal history.

○ Successful Salesmen
⊗ Doubtful Salesmen
● Unsuccessful Salesmen
◉ Saleswomen
◎ Salesmen who failed to pass course

Group B - 75 Members of School of Life Insurance Salesmanship - Winter 1920-21

CHART 9

TABLE 5

Frequency of use of certain variations in distinguishing successful from unsuccessful life insurance salesmen.

TEST	FREQUENCY
Flexibility in disguise	7
Personal history	6
Speed of decision, personal traits	6
Objections to purchase test	5
Freedom from self-consciousness	5
Care for detail	5
Interest analysis	4
Speed of decision, better traits	3
Test VI (intelligence)	2
Test XI (social relations)	2
Speed of movement	2
Assurance in visual memory	0

It will be seen from the study of the freshmen in the College of Industries and the College of Engineering, from this study of sales and design engineers and from the study of life insurance salesmen that experimentation must include a study of other things than mental alertness alone. In the first instance, we mentioned a test designed to bring out manipulative ability, and in the second illustration, we find that interest in occupations differs very materially. In the last more emphasis is placed on traits that fit one to handle situations involving others quickly, pleasantly and effectively.

At the beginning of this paper I stated that there were three important lines of investigation necessary to make vocational guidance a success. Up to this point I have mentioned two—careful research on the nature of occupations, and on the constellations of traits in human beings that might possibly indicate a fair measure of success in any selected occupation. The third point raised at that time deals with a problem in genetic psychology. It is common knowledge that there are traits and interests and activities exhibited by the child or by the boy or girl that we expect to be modified in greater or less degree as they grow older. In some respects we say "the boy is father of the man," but in others we at least hope that youthful characteristics will not be exhibited by the adult.

Experiments to determine the genetically continuous and discontinuous traits of the individual are in progress in at least five lines. The intelligence test as applied to school children throughout all the grades including college, and to adults out of college, demonstrates an exceptionally continuous capacity. All the experiments to date tend to prove that the relative mental capacity of the child determines his relative mental capacity as an adult. Professor C. E. Seashore's investigations of musical ability tend to establish similar conclusions with respect to exceptional ability in musical lines. More and more studies are being begun and pushed to conclusions regarding other types of exceptional children. Professor L. M. Terman has undertaken to estimate, and where possible to measure other traits than mental alertness as exhibited by school children. He expects to continue this study through different grades in order to discover if possible, other continuous traits. The psychiatrist has given us several important papers bearing on the question of emotional characteristics in the child, and their probable effects in adult life. It is upon these fundamental experiments and

investigations that we may hope sometime to establish the basis for vocational guidance from the point of view of genetic development. Until such studies have reached some greater degree of advancement, we cannot claim with any certainty that the characteristics exhibited by the child are permanent or continuous, or that they develop into those traits which give us adult characteristics suited for particular occupations.

I have discussed three sets of data that are, in my opinion, basic for proper vocational guidance and later placement in the most favorable opportunities for work. These are derived from properly set-up experiments on occupational requirements; on human differences in traits and on the development changes in human nature. Related fields of inquiry such as biology, sociology, psychiatry, industrial history, the technique of industry, educational practices, etc., will bring to these investigations correlated materials of importance. These related inquiries will give us the measures by which to gauge the success of vocational guidance and placement—the measure of the satisfied and satisfactory worker in his job. These related fields of study also describe in significant ways the setting wherein the fundamental experiments must be performed. We cannot hope to obtain valid results in a single laboratory, a single industrial group or in a single community.

The problems of personnel are dependent for their solution upon many investigators working in many communities. These solutions will be expedited if the investigators are in communication, and if their work is coördinated. It is a major problem in science to find for the individual his most favorable occupation, that in which he is capable of a maximum achievement.

News Notes

THE FEDERAL PERSONNEL BOARD

By executive order, dated December 23, 1921, President Harding has made an important advance in efficient handling of the large number of employees of the national government. The executive order was issued to the heads of departments and establishments through Mr. Charles G. Dawes, Director of the Bureau of the Budget.

The purpose, organization and duties of The Federal Personnel Board are outlined as follows·

1. For the purpose of developing in the federal government a more effective and economical system of employment and personnel management, and to promote the general welfare of the employees of the national government, there is hereby established a Federal Personnel Board under the supervision of the United States Civil Service Commission.

2. The Federal Personnel Board shall be composed of one representative from each department and independent establishment. The President of the Civil Service Commission of the United States shall be ex-officio Chairman of the Board, or said Commission may designate a chairman to act.

3. The Chief Coördinator for General Supply shall assign a representative to the Federal Personnel Board for the purpose of coördination as contemplated in Par. 6, Executive Order No. 3578, November 8, 1921.

4. Immediately upon receipt of this Executive Order the head of each department and independent establishment shall designate one representative to serve as a member of the Federal Personnel Board and shall designate such assistants to said member as the head of the department or establishment may deem necessary. As soon as practicable after receiving notice that all the members of said Board have been designated, the Chairman shall call the initial meeting of the Board for purpose of organization.

5. The duties of the Board shall be to formulate policies and plans designed to place the personnel administration of the federal government abreast of the best practice in private enterprise, with due regard to the peculiarities of the public service. In the prosecution of its activities it shall consider, among other things, the following:

a. The perfection of a liaison system between the Civil Service Commission and the several departments and establishments to ensure coöperation.

b. The perfection of methods whereby the Civil Service Commission will be advised regarding the success or failure of persons selected through its examinations, and whereby provision will be made for the reassignment or the separation from the service of persons who are unsatisfactory.

c. The personnel problems of each department and establishment, and the relation of those problems to the duties of each federal establishment, to the end that the entire personnel selection and administration may be more practical and more coöperative.

d. The development of an adequate system of personnel records which will furnish a medium for effective control of personnel administration and provide some basic statistics for such matters as retirements and disability, appropriation estimates, salary rate adjustments, etc.

e. The formulation of recommendations for the establishment and operation of a service through which employees may be assigned to the several departments or establishments in periods of maximum load, thereby permitting appropriations for the

several offices to be made on the basis of their normal loads.

f. The formulation of recommendations for the elimination or modification of the existing restrictions on transfer from department to department and the development of the personnel inventory system which will facilitate the assignment of specially qualified employees to those offices and duties in which their service will be of greatest value to the Government.

g. The possibilities of training employees for their positions with the object of reducing the period before an employee becomes an effective worker and through such training reducing the number of employees required for the task.

h. The extent to which it is practicable to adopt the principle of promotion from within in filling the higher positions in the service with a view to offering a career to properly qualified persons who enter the public service.

i. The desirability and practicability of developing a system for the more careful review of the selections for promotion.

j. The formulation of recommendations and plans regarding hours of service, leaves of absence, the privileges under the retirement act and other matters designed to obtain effectiveness of the public service.

EFFECTS OF THE ATMOSPHERE

We all believe that we work better under certain weather conditions than under others. We say it is too hot to work or too cold to work or too dry or too damp. Some of us believe we work better in good weather than bad, and others believe just the opposite. The whole question of the relation of atmospheric and climatic conditions to working efficiency has been continuously a subject of gossip and speculation. It has only recently been made the subject of scientific inquiries.

National Research Council through its Divisions of Biology and Agriculture, and of Medicine has organized a committee on human ecology, called Committee on the Atmosphere and Man. This committee is operating through three sub-committees:

1. The Committee on Atmosphere and Mortality.

2. The Committee on the Industrial Effects of the Atmosphere.

3. The Committee on Experiments.

The sub-committee on the Industrial Effects of the Atmosphere has set itself the following problems:

1. How much of the variation in industrial production is due to atmospheric conditions pertaining to

a. The climatic differences between different regions?

b. Local variations from season to season or day to day?

c. Indoor versus outdoor conditions?

2. What effect do specific atmospheric conditions such as temperature, humidity, variability, and various others exert upon production?

3. What is the most favorable combination of atmospheric conditions—the optimum? How can it be obtained? At what cost? And what difference will it make in production? How does it differ for different types of workers and in different occupations?

It is not anticipated, of course, that these can all be answered through a single inquiry or in a short time. It is intended, however, that records shall be instituted which will indicate answers to certain of the questions and accumulate data that may lead to the solution of others.

Two general types of record are desired dealing respectively with variations in atmospheric conditions and with variations in production.

1. Temperature and relative humidity out-of-doors and in the rooms where the operatives are at work. Other conditions such as chemical pollution, dust, etc., may be measured in special cases.

2. Records of production in such form that an exact figure can be obtained for each day showing the average hourly output per person. Details for individual hours will not usually be needed. The figure may be in the form of wages where piece workers are concerned, or in any other form that shows actual output. In most cases it is hoped that the records for each individual can be kept separately, but in other cases it will be best to obtain merely the sum total of all the production in a given line and di-

vide it by the number of operatives present that day and by the number of hours when the machinery was running, stock was available, and the operatives were actually able to be busy.

The minimum requirements for atmospheric observations are

1. A record of outdoor conditions, available for the most part from the United States Weather Bureau.

2. Indoor records obtained by recording thermographs and hygrometers, checked by readings from wet and dry thermometers.

3. A check for systematic errors in recording instruments.

4. In certain cases periodic readings on wet and dry thermometers where recording instruments are not available.

Difficulty is always involved in securing adequate production records for a study of this sort. It is hoped, however, that it may be met by

1. Careful selection of plants for the study, only those with careful and adequate production records being chosen.

2. Selection of operations which are as free as possible from seasonal or accidental fluctuation, together with classification of types of operations.

3. Selection of types of operatives to eliminate erratic workers and floaters, whose records would carry over only a short period of time, also beginners so that the records will not be influenced by the learning process, increase in skill, etc.

4. Selection of groups engaged as nearly as possible on steady work.

5. Wherever necessary, supplementing ordinary factory records by more intensive records dealing with absences, lateness, and their causes, shutdowns, variations in production schedules, labor troubles, and their influence on output, etc.

The sub-committee has completed its plans for the investigation. It has secured the assent of a number of concerns to make use of their plants for the study. It has conditionally secured the assent of an instrument company to furnish the recording equipments desired. It is at present, however, in need of funds to cover a certain amount of traveling expenses and to insure adequate supervision of the record keeping process.

The following constitutes the personnel of the sub-committee.

Ellsworth Huntington, Chairman, Yale University.

R. H. Lansburgh, University of Pennsylvania.

F. S. Lee, Columbia University.

Leonard Outhwaite, Personnel Research Federation.

A. H. Ryan, Scovill Manufacturing Company.

R. L. Thompson, U. S. Public Health Service.

THE NEW FOUNDATION FOR THE APPLICATION OF PSYCHOLOGY AND PHYSIOLOGY TO INDUSTRY AND COMMERCE IN ENGLAND

The first number of *The Journal of the National Institute of Industrial Psychology* appeared under date of January 1, 1922. It is published by the National Institute of Industrial Psychology. The minimum annual subscription to the *Journal* and other publications of the Institute is given as £1. The address of the Secretary is National Institute of Industrial Psychology, 329 High Holborn, London, England.

The introductory editorial states "The *Journal* will describe in non-technical language the methods and results of applying scientific knowledge to the human aspects of industry and commerce." This *Journal* is planned as the organ of the National Institute of Industrial Psychology but invites contributions from all workers in the field whose investigations aim to promote "the mental and bodily health and efficiency of every grade of worker."

The initial article of the *Journal* describes the early history of the Institute. This quite full account is noteworthy as evidence of the new interests in scientific research in human aspects of industry. The first steps in forming the Institute were taken by a business man, Mr. H. J. Welch, Director of Harrisons and Crosfield, Ltd. Dr. C. S. Meyers, the noted English psychologist, was approached by Mr. Welch in 1918 "with a view to initiating some scheme whereby the results of research in Physi-

ology and Psychology might be utilized for vocational selection and vocational guidance and for the improvement of human conditions generally in commercial and industrial life." Decision to incorporate and begin work was made on the 14th of July, 1920, and incorporation as the National Institute of Industrial Psychology was completed February 11, 1921.

The Council of the Institute is a roster of men and women prominent in industry, commerce, medicine, education, art and science in England. Employers and labor leaders are listed as members of the Council in support of scientific research as of ultimate advantage to the worker. Representatives interested in founding the Institute appealed to Universities for those most interested in the practical application of Psychology and Physiology for coöperation in the scientific work of the Institute. "A strongly representative scientific committee of twenty-five members" resulted from this call and met to discuss problems and methods. The *Journal* gives a report of their first meeting.

Besides listing numerous problems now being investigated and suitable for further investigation, the report notes the formation of a sub-committee to determine:

a. Standard of qualifications necessary for candidates for training as industrial psychologists.

b. Salary of investigators.

c. Allocation of grants to Universities.

d. Publication of a Journal.

e. Scheme for rota of lectures to suit each district.

The report further states that the work of the Institute may now be described as follows:

1. The study of the requirements of various industrial and commercial occupations, and the elaboration and application of suitable tests so as to secure (*a*) in cooperation with industry and commerce, more efficient and scientific selection of workers, and (*b*) in coöperation with the schools, more reliable guidance for children when choosing their life's work.

2. The investigation of the best methods for applying human energy in different factories, offices, etc., especially in regard to (*a*) the elimination of unnecessary movements, (*b*) the most advantageous distribution of rest periods, (*c*) the reduction of monotony and increase of interest, etc.

3. The determination and realization of the conditions which tend (*a*) to the maximal health, comfort and well-being of the worker, and (*b*) to the best relations between management and labor, e.g., in regard to lighting, ventilation, methods of payment, labor representation, etc.

4. The study of the factors influencing the sale of products, e.g., advertisement, designing, etc.

5. The provision (*a*) of lectures to employers and to workers, and (*b*) of training courses for managers, foremen, welfare workers, investigators, etc.

6. The encouragement and coördination of research work on industrial psychology and physiology throughout the Kingdom, and the publication of the facts established by such research in a form which will indicate their practical value.

The early steps in the formation of this important organization were financially supported by industrial concerns. Additional funds for permanent support were obtained from an increased number of industrial and commercial firms and from the Carnegie United Kingdom Trust. The Institute plans to establish branches throughout the Kingdom and to equip the London headquarters with library and laboratories "commensurate with the importance of the Institute's work". When investigations are carried out which are likely to result in an immediate advantage to a firm, fees are charged which cover the salaries of the investigators and include overhead charges of the central body.

Reports of research in this first number of the *Journal* include:

I. An Investigation into the Tin Box Industry, by E. Farmer and R. St. C. Brooke.

II. An Investigation into the Packing of Chocolates (I.), by E. Farmer and A. B. B. Eyre.

III. The Economy of Human Effort In Industry, by E. Farmer.

IV. Tests for Clerical Occupations, by Cyril Burt.

INDUSTRIAL PSYCHOLOGY IN JAPAN

On February 28, Dr. Yoichi Uyeno, Director of the Institute of Industrial Psychology in Tokyo, was the guest of the Division of Applied Psychology at Carnegie Institute of Technology. Dr. Uyeno kindly prepared the following account of the present status of industrial psychology in Japan for the *Journal of Personnel Research*.

During the war, the necessity of having some institution which would aid in establishing a good relationship between labor and capital was felt by the Japanese Government. The government, therefore, proposed to establish a fund of $1,000,000 for that purpose and several prominent business men added to that the sum of $3,000,000. Thus a Japanese Association for the promotion of good industrial relations was formed in 1917. The name of the Association is Kyocho-kai which means literally, an association for harmonious cooperation or conciliation. The Association stressed educational activities chiefly.

In 1921, the Department of Industrial Psychology was organized as the third division of the Association, the first division being that of Labor Disputes, the second that of Social Education. The main purposes of the Institute of Industrial Psychology are as follows:

1. To furnish an equipment and staff for psychological research in order to make it the scientific basis of management. For this purpose a psychological laboratory has been equipped for the study of efficiency methods.

2. To provide a training class through which men who are employed as managers in the different factories may get sufficient instruction in the psycho-physical nature of the laborer. In this course, therefore, such branches of study as the history of scientific management, essentials of scientific management, general psychology, experimental psychology, method of mental tests, vocational psychology, practical efficiency methods, economies, etc., will be taught.

3. To promote efficiency increasing management. For this purpose some of the staff will be dispatched to the factories when requested.

4. To provide a library where all information appertaining to the subject of industrial psychology will be available to any one for study.

Since 1920, Dr. Uyeno, the editor of the *Journal of Psychological Research* (established in 1911), has been working in some factories in Tokyo and in Osaka to install modern efficiency methods and his results have been very successful. He found that in the time of depression after the war, the only way to make labor and capital cooperate with each other is to reduce the cost of production by installing scientific management methods and share the profits thus obtained between labor and capital, and, if possible, with consumers, too.

He is now making a world tour of one year to visit the laboratories of industrial psychology in America and in Europe and to see the industrial plants and concerns where the psychological methods are applied to their business.

In Japan there are three journals of psychology:

1. *Shinri-kenkyu*, a monthly journal of psychological research established by Dr. Uyeno in 1911, an organ of the psychological laboratory of the Imperial University of Tokyo.

2. *Hentai-shinri*, a monthly journal of abnormal psychology, edited by Dr. S. Nakamura, (established in 1918).

3. *Nippon-shinregaku-zasshi.*, a quarterly journal of psychology edited by Dr. G. Kuroda, an organ of the psychological laboratory of Kyoto Imperial University (established in 1920).

The chief American books on psychology and scientific management methods which have been translated into Japanese are as follows:

1. Angell—Psychology. Translated by Dr. Uyeno.

2. Stanley Hall—Adolescence. Translated by Dr. Motura and others.

3. Stanley Hall—Youth. Translated by Dr. Wada.

4. James—Psychology. Translated by Dr. Fukurai.

5. James—Varieties of Religious Experience. Translated by Mr. Sakma.

6. Woodworth—Dynamic Psychology. Translated by Mr. Yanagisawa.

7. Scott—Two books on Psychology of Advertising.

8. Taylor—Scientific Management. Translated by Mr. Kudo.

9. Munsterberg—Psychology and Industrial Efficiency.

10. Thompson—Theory and Practice of Scientific Management.

Among the recent works along the line of industrial psychology the following may be enumerated.

1. Dr. K. Tanaka. An Experimental Study on the Relation of Fatigue to Recovery.

2. Dr. K. Tanaka. Mental Test as a Substitute of Entrance Examination to High Schools.

3. Dr. Y. Uyeno. Reports on the Results of Installation of Efficiency Methods in Lion Tooth Powder Manufacturing Company in Tokyo and Club Toillette Preparation Manufacturing Company in Osaka.

4. Dr. A. Berliner and Dr. Y. Uyeno. Application of Rank Method for Selecting the Best Types of Characters for the Use of Advertising a Tonic Drink manufactured by Lacto Company of Tokyo.

5. Dr. I. Terasawa. Physical and Mental Tests Applied to the Telephone Operators in Tokyo.

NATIONAL VOCATIONAL GUIDANCE ASSOCIATION CONVENTION

At the convention of the National Vocational Guidance Association, held at Chicago, February twenty-third and twenty-fourth, a section meeting was devoted to Psychological Tests in Relation to Vocational Guidance. The program included the following addresses:

Application of Psychological Tests in Classifying Children for Vocational Guidance. Dr. Ruth E. Clark, Vocation Bureau, New York City.

The Use of Job Analyses in Determining the Significance of Personal Qualities. Professor F. A. Kingsbury, Department of Psychology, University of Chicago.

The Present Procedure of the Vocation Bureau of the Cincinnati Public Schools with Regard to the Use of Psychological Tests. Dr. Mabel R. Fernald, Vocational Bureau, Cincinnati, Ohio.

Educational Guidance in Music and Art. Dr. Elmer E. Jones, School of Education, Northwestern University.

Applications of Psychology to Vocational Guidance Problems in Rochester. Dr. Louis Peckstein, Department of Psychology, University of Rochester.

CONFERENCE ON BUSINESS TRAINING OF THE ENGINEER AND ENGINEER TRAINING FOR STUDENTS OF BUSINESS

A public conference will be held May 1 and 2 at Carnegie Institute of Technology in Pittsburgh. The Conference is called by the United States Commissioner of Education on behalf of the committee on commercial engineering appointed by him to investigate business training of engineers and engineering training for students of business. G. L. Swiggett, specialist in commercial education in the Bureau of Education, is Chairman. This is the second conference held under the direction of this committee and the Chairman says it is planned to have this second conference even more constructive than the first. Four major topics at the Pittsburgh conference will deal with the new problems that have recently arisen in modern industries, the solution of which demands a more scientific approach to include job analyses and personnel specifications, and a translation of these into a new and teachable content for use in engineering and commerce schools; with the training of the engineer for a better understanding of problems relating to community development; and with the training of the engineer for management of overseas engineering projects. These will be presented and discussed at general and round table sessions by business men, educators, and engineers.

RESEARCHES AT BRYN MAWR

The following researches have been undertaken by Miss Gladys Boone of Bryn

Mawr College: (1) Survey of the position of women in Trade Unions in Philadelphia. (2) Study of methods of wage payment in the Textile Industry in Philadelphia.

INDUSTRIAL AND VOCATIONAL TRAINING ACTIVITIES OF CORRECTIONAL INSTITUTIONS

The Division of Education and Classification in the New Jersey State Department of Institutions and Agencies is conducting researches into the industrial and vocational training activities of the several correctional institutions of the state. Mr. Jackson has done some preliminary work in the way of studies of temperament and personality as bearing upon industrial placement and vocational training. The future plans of the Division include the improvement of industrial placement by means of direct tests of mechanical ability.

PERSONNEL IN AN UNDERGRADUATE JOURNAL

The undergraduates of the School of Commerce and Administration of the University of Chicago publish a magazine entitled Commerce and Administration, the February number of which was devoted to Personnel. Contributions of more general interest include:

The Proper Coördination of Labor and Capital. Henry S. Dennison.

The Influence of the Business Cycle upon Personnel Problems and Policies. Paul H. Douglas.

Personnel Work in the Retail Field. Philip J. Reilly.

John Calder discusses some of the personnel problems of Swift and Company, and Kenneth Bates and Erwin G. May report on an analysis of the labor turnover of a railway in a limited district during the second half of 1920.

THE PSYCHOLOGICAL CORPORATION

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Book Reviews

THE FOREMAN AND HIS JOB

By Charles R. Allen. ix + 526 pp. 1922. J. B. Lippincott Company, Philadelphia

REVIEWED BY CLARENCE S. YOAKUM

Among the various methods of improving foremanship is one that is commonly known as the conference method. The author has used this method quite extensively and has set down here something of the procedure he has developed. The author states that the book is intended as a suggestive guide to those conducting such conferences. The book is built around an analysis of the foreman's job. The author disclaims completeness.

Jobs are divided into work jobs, with two subdivisions, service and production, and responsibility jobs. The foreman's job is a responsibility job. On analysis it breaks up into three fields or sub-jobs, supervisory responsibility, managerial responsibility and instructing responsibility. A foreman is one "*who stands next to the working force*" and, therefore, is responsible to the men and to the management. The knowledge required, beside knowing the work of his men, consists in knowing his responsibilities in each case and being able to "put it across."

The factors used for illustration throughout are production, supervision, cost control and instruction. Chapters III to VII inclusive deal with the methods of analysis used to develop a description of the foreman's job. Readers interested in job analysis will find these chapters particularly interesting. Each of the three fields or general foreman jobs may be subdivided into "blocks" and each "block" into "general responsibilities." A "block" is a group of supervisory responsibilities, all of which require a man to think of the same sort of thing when he discharges them. These blocks are, for example, (1) stock, (2) operations and processes, (3) tools and equipment, (4) the working force, (5) information, (6) human factors. The general responsibilities involved, for example, in "stock" might concern stock raw, in process, or finished or all three. The "base" here would be "condition of stock." General responsibilities may be divided into "specific responsibilities," these into "detailed responsibilities;" and these further into "responsibility points." Managerial and instructional lay-outs may be developed in the same way.

Part III attempts a further analysis of supervision and management from the points of view of standard practice and cost accounting. Parts IV to VIII inclusive discuss in detail the fourth, fifth and sixth "blocks." Part IX illustrates the method of the book by using a human factor—carelessness on the job. Part X deals with the instructing job or field.

The book contains a large amount of interesting detail. Each chapter ends with a number of suggestive problems. Appendix A contains notes on how the book should be used. Appendix B gives a tentative analysis of "supervisory general responsibilities." The book has no index.

INDUSTRIAL FATIGUE AND EFFICIENCY

By H. M. Vernon. 1922. E. P. Dutton and Company, New York City

REVIEWED BY LEONARD OUTHWAITE

Dr. Vernon has written a sensible and useful book on industrial fatigue and on its relation to plant efficiency. His good sense is evinced in his choice of field, as well as in his methods of work in that field, and in his presentation of results. The usefulness of the book is enhanced by the fact that he has collected, summarized and made available his own work and that of others which has hitherto appeared in print only in the form of special bulletins and occasional reports.

Dr. Vernon accepts as his definition of fatigue, in so far as it is an industrial manifestation, the central ideas advanced in the definitions of the British Association Committee and of the Health of Munition Workers Committee. These agree in defining fatigue as a diminished capacity for work, due to the length and intensity of previous activity or to a lack of rest. This essential notion of industrial fatigue he refers to as objective fatigue, and it is the study of this phenomena to which his book is really devoted. He appears, however, to agree with Dr. Rivers that this objective fatigue is frequently accompanied by subjective fatigue, "the sensations which supervene during the performance of work." Subjective and objective fatigue do not run parallel courses. Dr. Vernon says, "In the study of industrial fatigue it is natural for us to pay special attention to the objective side of the phenomenon, the capacity for work, though sooner or later we are inevitably driven to study the subjective side as well, and in no less degree." He has refrained from an attack upon the latter type of study, evidently from a recognition of the fact that he has not at hand a technique for dealing with it. He has thus avoided two dangers, that of accepting and reproducing as valid the operative's own description of the work's effect upon him and that of generalizing the personal reaction of the observer of industrial processes, both of which were characteristic of some of the earlier studies that dealt with fatigue.

He has likewise been careful to amplify his definition by pointing out that "up to a certain point fatigue is a natural physiological condition, which is inevitably incurred as the result of industrial work, and it does good rather than harm to th worker."

He feels, "One of the most important objects of fatigue study is to determine whether the fatigue induced by an industrial occupation has an unfavorable influence on the health of the worker." One of the difficulties in this determination is the fact that the effects of fatigue on health and consequently on production do not necessarily show themselves at once, and also that it is sometimes difficult to distinguish whether the effects are "due to the direct fatigue induced by the occupation, or to the adverse conditions under which the work is performed. It is evident, therefore, that the problem of determining the influence of industrial fatigue on the health of the worker is no easy one. Its solution can be effected only very gradually, and as the result of much observation and experiment."

If the primary object is that of avoiding *injurious* fatigue, the secondary one may be described as that of avoiding *unnecessary* fatigue. Even though a healthy industrial worker starts each day with a certain stock of physical energy it is not necessarily expedient that he expend the complete store upon his industrial labor. Some of it will be reserved for other purposes. "In any case, the healthy worker has each day a certain supply of energy which he puts into his daily task, and it is evident that the more of this energy he expends in wasteful and unnecessary directions, the less he has for application to useful ends. Every time he expends energy unnecessarily he di-

minishes his efficiency." It is the object of this second type of fatigue study, by decreasing the amount of energy expended on some operations, to increase the effectiveness of performance in others.

It follows from his definition and statement of objects that Dr. Vernon's studies were carried out almost exclusively in plant and workshop. He says in his preface, "The information adduced relates only to workshop practice, as laboratory investigations on fatigue, though holding out promise of useful results in the future, have hitherto not afforded much evidence of direct and practical value." This evaluation of laboratory studies as against plant studies is further developed in the following paragraph from the introductory chapter. "No reference will be made to the various laboratory methods which have been adopted for investigating fatigue. Suffice it to say that, though some of them have thrown a great deal of light upon the conditions of production and avoidance of fatigue, none of them afford a satisfactory measure of fatigue under industrial conditions. The ideal to be aimed at is a test which can be easily applied, in the course of a few minutes, to any industrial worker at any time in the course of his working day, and afford a quantitative measure of his state of fatigue.

"It is highly improbable that any single test will ever be found sufficient for all industrial workers, for the character and localization of fatigue is so different in different occupations."

The primary criterion for the determination of fatigue is performance on the job, but the author is cautious in his acceptance of the reliability of production data. They are modified, he says, by a number of factors, any of which may impair their reliability. Among them, may be mentioned the worker's mental states and his willingness to accomplish his work to the best of his ability. The performance may be adversely effected by the knowledge that he has a long five hour work period before him or accelerated by the knowledge that his spell is almost ended. Accordingly, in performance observations, particularly those relating to hourly variation of output, the existence and detection of such phenomena as monotony and spurt becomes of great importance. Other methods mentioned as indicative of the presence or absence of fatigue are sickness, errors in work, and accidents.

Having defined his subject and method, Dr. Vernon procedes to discuss in succeeding chapters a number of topics centering around the fatigue problem. The data for these presentations and discussions have been taken from

1. A. F. S. Kent—Reports of Industrial Fatigue.
2. Memoranda 18 and 21 of the Health of Munition Workers Committee.
3. Recent reports of the Industrial Fatigue Research Board.
4. British Association Reports.

For this country from the work of

1. United States Public Health Service.
2. Goldmark—Fatigue and Efficiency.
3. Reports of National Industrial Conference Board.
4. F. S. Lee—Human Machine in Industry.

The data from these sources are grouped so as to throw light upon a number of questions, some of the more important of which are "Hourly Output and Daily Output" (Chapter II), "Output in Relation to Weekly Hours" (Chapter III), "Work Spells and Rest Periods" (Chapter VI), "Lost Time and Its Causation" (Chapter VIII). Other chapters deal with sickness, accidents and their causes.

One of the most interesting individual chapters in the book is that dealing with "Limitation of Output" (Chapter VII). Significance attaches to it because it brings some quantitative studies to bear upon a subject that has too frequently been left to estimation, assumption and debate. It is also of special value when considered in connection with the preceding chapters dealing with the relation between hours and output, since the validity of work in output figures, as throwing a light on industrial fatigue must depend upon the ability of the investigator to determine conscious limitation of output. The method which the author employes in detecting limitation of output makes the assumption that varia-

tion in output for a reasonably large group of industrial workers will in general follow the Gauss' Law of Frequency of Error. It may be plotted against a probability curve, and will show a general conformation, unless the rates of output are being influenced by artificial restriction, either the will of the men, themselves, or by such a mechanical factor as machine speed.

The final chapter of the book deals with practical conclusions. The conclusions are advanced with a good deal of reservation and are not particularly novel in their content. Dr. Vernon is not anxious to generalize or ready to formulate universal conclusions relating to fatigue phenomena. He is primarily concerned with pointing out that we are developing a technique for a series of plant studies throwing light on fatigue and its related problems. Dr. Vernon's most important single conclusion is that, "The secret of progress in the science of industrial fatigue is the adoption of the experimental method, and the rate of progress depends very largely on the interest and coöperation of employers."

In reading the book, one becomes conscious at times of the unrelatedness of materials and of hiatuses in the argument. This defect, to the extent that it is present, is not solely due to the author. It is a reflection of the present development of work in this field. At the present time there are facts available throwing light on some subjects in a good many industries and varieties of operations but not appearing at all in connection with other industries and operations. We have certain studies for light operations but not corresponding ones for heavy operations; for example, Dr. Vernon was able to report hourly output figures for women covering chocolates and for women working stamping presses but there is no treatment showing fluctuation for these operations when it comes to dealing with output in relation to the weekly hours; so too, he is able to report the output of tinplate millmen in relation to weekly hours but not in relation to hourly output. Some industries and operations have been well covered and others not covered at all. The upshot of it all is that we begin to see light on a number of specific points and in a number of more or less unconnected situations but we are not able, as yet, to see relationships over the field as a whole. In this situation there always exists the danger that workers in the field instead of sticking to their job, which is that of amplifying old studies and initiating new ones. and of gradually classifying and and systematizing their materials, will be led to attempt the latter functions before they have progressed sufficiently with the former. This danger, Dr. Vernon has for the most part successfully avoided. The book is, therefore, one which can be read by the business man and plant executive with interest and profit, and by the technician in the field with respect.

INTELLIGENCE TESTS AND THEIR USE

By G. M. Whipple, Editor. The Twenty-first Year-book of the National Society for the Study of Education. ix + 289 pp. 1922. Public School Publishing Company

Reviewed by Mildred Schultz

The Twenty-First Yearbook contains a fund of information of intelligence tests and their use compiled, the Committee of the Society states, "for the purposes of correcting errors and misunderstandings and of explaining in a clear and accurate manner their theory, nature, and practical use." Everyone who has watched the precipitate development of mental tests in general, and of intelligence tests in particular, has been conscious of the need of pausing to take stock, so to speak, of what has been accom-

plished up to the present time. In filling this need, the present *Yearbook* renders a service not to the educational field alone, but to the allied fields of industry and commerce and to any others in which tests are or may be used.

Part I is devoted to the Nature, History, and General Principles of Intelligence Testing and contains contributions by Professors Thorndike, Colvin, Rugg, and Whipple. Part II deals with the administrative use of tests in schools. It is essentially a series of reports by professional men and women qualified by experience to speak of the efficacy of tests in grades ranging from the primary and kindergarten through the college and university. The book does not pretend to contribute anything new to the subject of tests except, perhaps, in so far as some of the plans reported in Part II may be a source of inspiration to other educators. The very breadth of the book's appeal presents difficulties of presentation and its form renders repetition inevitable, but it has succeeded in its purpose of summarizing the history and general principles of intelligence tests and of correcting various existing errors and misunderstandings.

SCIENCE AND COMMON SENSE IN WORKING WITH MEN

By Walter Dill Scott and M. H. S. Hayes. ix + 154 pp. 1921. The Ronald Press, New York

REVIEWED BY CLARENCE S. YOAKUM

Executives are coming to realize that "workers differ in the things they are fitted to do and capable of doing; that they differ, likewise, in their interests, ambitions, and the things that seem to them desirable; and that as men of differing capacities and desires they require individual adjustment to the opportunities offered them in the field of industry." The authors have undertaken to show in this compact little book the significance of this new point of view and to emphasize the necessity of using both science and common sense in personnel work. The book calls specific attention to two sets of objections: The increased commercial benefit to be derived in the way of increased production, decreased turnover and heightened morale and the obligation to afford every man an opportunity to make the most of himself, to be given a chance to go as far as his capacities enable him, his interests impel him and the opportunities of the organization permit (p. 14). The book deals with the *function* of personnel. It presents all too briefly certain modern methods of bringing about the relationships between management and men just quoted. These methods are mainly scientific procedures designed to establish practical measures of individual differences that can be used in industry.

Special emphasis is placed on the need of knowing as thoroughly and scientifically as possible the physical and mental capacities of the individual worker. Careful distinctions are drawn between tests that give information on these and tests and questions designed to bring out the individual's technical ability and previous trade history. Three chapters are devoted to estimating character qualities and discovering the desires that motivate the individual worker. Two chapters are used in part to develop the function of the job analysis.

The reviewer questions whether the presentation of the several novel methods of measuring human differences will not lead the reader to overlook the *function* of personnel. He feels that more space should have been devoted to making clearer the idea that the prime function of personnel is the development of men. If the presentation of methods were part of the objective all too little space is devoted to these. The writers promise us on page 10 to develop these specific topics more fully at a later date. Detailed demonstrations of the close relationship between developing men and commercial benefits are urgently needed.

HOW TO MEASURE IN EDUCATION

By William A. McCall. xii + 416 pp. 1922. The MacMillan Company, New York

REVIEWED BY OAKLAND MAUPIN

This book has according to the author a fourfold aim, viz.:

1. To present the successes and warn against a repetition of the mistakes in the science and art of educational measurement.

2. To help forward the movement for making teaching a genuine profession.

3. To meet the needs of educators who are interested in both the How and the Why of mental measurement.

4. To bring together in one convenient volume most of the technique needed by those engaged in mental measurement.

To workers in educational and industrial fields who are concerned with the problems connected with measuring ability and attainment, the book calls attention to the importance of scientific method. All too frequently both educators and personnel men fail to appreciate the fact that system and method are of even greater importance in handling people than in the layout of the plant or the routing of material. The three parts of the book, How to Use Measurement, How to Construct and Standardize Tests, and Tabular, Graphic and Statistical Methods, cover points that are continually being raised by those who find themselves forced to evaluate this new method that is rapidly making its way into industrial and commercial fields.

It is inspirational and optimistic in tone. The writer has successfully emphasized the importance of scientific measurement in education and in industry. The book will help to widen the application of scientific knowledge.

Abstracts

How to Analyze your Working Force. EUGENE J. BENGE. Management Engineering, March 1922.

Describes the use of sorting and tabulating machinery in studying labor turnover. Hollerith or Powers cards are punched for each employee at the time he is hired; fifteen or sixteen items are recorded such as color, nationality, age, number of dependents, etc. This is the first step and results in an elaborate company census. At the time of leaving, other items are added to the card for each individual, such as reason for leaving and date left. The labor turnover may then be analyzed in terms of each of these items, and those items which show high turnover may then be considered in hiring new employees. Deals only with results obtained at the Atlantic Refining Company of Philadelphia, but indicates a general method by which turnover can be analyzed more methodically than by the ordinary "reasons-for-leaving" forms. It is probable that other companies, in using it, would obtain comparable results.

Unemployment Prevention. JOHN R. COMMONS. American Labor Legislation Review, March 1922, Vol. XII, No. 1, pp. 15–24.

Discusses various economic theories of unemployment; those of the traditional economists, the Marxian socialists, and the wage worker. Unemployment is largely caused by the operation of the credit system with its cyclical changes. Unemployment insurance is the only method which can bring home to the bankers, the financiers, the absentee investors, who control modern industry, the responsibility of capitalism for that same security of the job which they already obtain in the security of their investments.

Depression Insurance: A Suggestion to Corporations for Reducing Unemployment. HENRY S. DENNISON. American Labor Legislation Review, March 1922, Vol. XII, No. 1, pp. 31–36.

Sets forth steps which have already been taken by employers in seeking a solution for unemployment. These are classified as follows:

For seasonal control
- Planning ahead
- Inducing early ordering
- Adding supplementary merchandise
- Training operatives to two jobs
- Inventing devices to protect against weather

For cyclical
- Furnishing statistical information
- Planning ahead
- Adapting credit facilities
- Establishing labor exchanges
- Cultivating thriftiness

Advocates that some intelligent experiments in the field of unemployment be made at once, on the ground that it is better social cost-keeping to add the overhead burden of unemployment to those goods which are responsible for irregular employment, than to draw it from the savings of the working group. Further proposes to set aside a part of the unemployment relief fund as a special depression insurance fund which will be used under appropriate rules to finance making for stock more of certain staples than could be made without the help of this fund. This proposal is advanced because for a fairly large class of goods it is found that it would be cheaper to manufacture to stock and store for long periods than to pay unemployment relief for idleness.

Absentism: A Quantitative Study. J. D. HACKETT. Management Engineering, February 1922, Vol. 2, No. 2.

Defines absentism, lateness, suspension, etc. Discusses classification of absence as preventable and unpreventable. Statistical tables compiled from a variety of sources dealing with questions of absence and absence as influenced by such factors as sex, age, nationality and day and night work. Discusses means of diminishing absentism. The imposition of penalties appears to be an attack upon the problem of absentism from the wrong end. Workers whose bonus is commuted or who are fined for absence feel that their obligation is discharged and there is no further incentive to be regular. The wage loss incurred by absence is in the nature of a fine and the further loss of a small percentage is not much of a deterrent. If it is a question between rewards for attendance or penalties for absence, the former is to be preferred.

National Research Council. VERNON KELLOGG. Educational Review, December 1921.

Outlines the purpose and activities of the National Research Council and brings out the value of these to industry. One vital service of the Council is its restraining influence upon the tendency for industry to drain the supply of scientific men to satisfy its present needs, thus robbing the universities of scientific workers and teachers whose influence and inspiration must provide scientific men for the future. The Council solves the difficulty by providing advisory boards of scientific men to aid industrial organizations in establishing research laboratories and in planning lines of research most advantageous to the development of the fundamental science underlying the applications made use of by these industries. This is, of course, only one example of the activities of the Council.

The Sales Plan for 1922. H. G. KENAGY. Administration, April 1922, Vol. 3, No. 4, pp. 469–479.

Explains general procedure and plan used by Bureau of Personnel Research of Carnegie Institute in studying sales problems of a number of companies. Discusses percentages of time spent by salesmen in various elements of their jobs. In no case has the amount of time spent face to face with the prospect exceeded 25 per cent of the salesmen's working time. Detailed time and other analytical studies are of great importance. Two charts show steps in the analyzing of the various phases of salesmen's jobs. A third chart shows a rating scale for judging the abilities of a salesman. Successful sales management in 1922 calls for

1. Thorough analysis of sales possibilities.
2. Improved selection of salesmen.
3. Continuous training of salesmen on the job.
4. Careful supervision of entire sales force.
5. Proper organization of the sales department.

Plans for 1922 should look beyond present year and provide foundation for sales policy of next decade.

The Creation of Interest and Good-Will Through General Education in Industry: The Responsibility of Industry. HENRY C. LINK. Administration, March 1922, Vol. 3, No. 3, pp. 335–347.

Discusses the responsibility and means for general education in industry. A company may profitably and advisedly assume full responsibility for general education only in those fields involving the facts and processes which characterize its business. Such education should have the following results:

1. Stimulation of the interest and goodwill of the employees within a company.
2. Improvement of the condition of a company itself.
3. Creation of a better understanding of the economic system at large.

The most commonly used mediums of company education are

1. The company paper.
2. Bulletin boards.
3. Pay envelopes.
4. Motion pictures and employees' meetings.

5. Booklets describing company activities.
6. Trips of inspection.
7. Advertisements and sales publicity.
8. The company library.
9. Profit-sharing plans.

Companies should present the material in a way which meets the requirements of sound pedagogy and yet avoids the mistakes of the propaganda method, always keeping in mind the natural inertia of most employees toward education.

Good Industrial Relations in the Office. WILLIAM W. MCCLENCH. Administration, March 1922, Vol. 3, No. 3, pp. 273–278.

Recommends the following steps as likely to promote the efficiency and morale of an office force:

1. The cultivation of industrial relations between officers and clerks.
2. Analysis of the office into definite departments, analysis of the routine of each department into jobs, and of each job into minute processes which are easy to perform.
3. The substitution of mechanical office methods for clerks in as much of the routine work as possible.
4. The spread of interacquaintance of departments with each other's purposes and methods so as to restore the unity which would otherwise be broken up by departmentization.

Has special reference to the practices of the author's own organization—The Massachusetts Mutual Life Insurance Company.

Safeguarding Employment: The "Cleveland Plan" of Unemployment Compensation. WM. J. MACK. American Labor Legislation Review, March 1922, Vol. XII, No. 1, pp. 25–30.

The Cleveland Plan is described as a combination of a guaranty of production by the workers to their employers, and a guaranty of employment by the employers to their workers. Part of the plan establishes the fact that wages should be paid according to standards of production, and what constitutes a fair and proper production should be determined by industrial engineers under the supervision of the Impartial Chairman. It has been successful because it was agreed that the engineers would be selected and paid by the Union and the Manufacturers' Association jointly. It was further agreed that the standards should be based on the time of the average worker in each shop and not upon either the very fast or the very slow workers. Each manufacturer guarantees to his regular workers who do not leave voluntarily and are not justifiably discharged, twenty weeks of work during each half year. The workers must bear the burden of the other six weeks. If the employer fulfills his guaranty, by giving them such work, he has met his obligation; but if he does not provide twenty weeks of work out of the twenty-six weeks, his employees become entitled to two-thirds of their respective minimum wages. The agreement for 1922 provides a forty-one week guarantee for the whole year instead of twenty weeks each half year.

Costs of Labor Turnover. WALTER J. MATHERLY. Administration, April 1922, Vol. 3, No. 4, pp. 464–468.

Discusses various items entering into costs of labor turnover and advocates keeping a record of these costs. Costs may be classified under three heads, those to employer, to employee and to the public. Corrective action will follow recognition of the extent of unnecessary costs.

Group Will-Temperament Tests. M. J. REAM. Journal of Educational Psychology, January, 1922.

Reports an experiment with a group form of the Downey Will-Profile test which was devised to measure character traits independent of intelligence. The scores of a group of insurance salesmen reveal high correlations between several of the different parts of the test and records of production.

Employers' Coöperation with Saving Banks in Promotion of Thrift. A. M. SAKOLSKI. Administration, March 1922, Vol. 3, No. 3, pp. 305–311.

Surveys and criticizes various thrift and savings plans instituted by large American

corporations. Distinction is made between stock bonus plans and other measures intended primarily to promote the employees' loyalty, and plans aiming solely to encourage savings. The promotion of thrift among workmen is better and more easily accomplished by encouragement of savings through established popular institutions than through the creation of special savings funds, or thrift subsidies, bonuses, and the like. Special favorable reference is made to the plan instituted by the New York Telephone and Telegraph Company.

Common Colds in Relation to Industrial Hygiene. HAROLD G. TOBEY, M.D. Journal of Industrial Hygiene, March 1922.

Defines and describes colds. Colds and their sequelae are an important factor in industrial absentism. Sections deal with symptoms, infection, treatment and complications. Emphasizes the importance of early and more accurate diagnosis, differentiated treatment and special examination for resistant cases.